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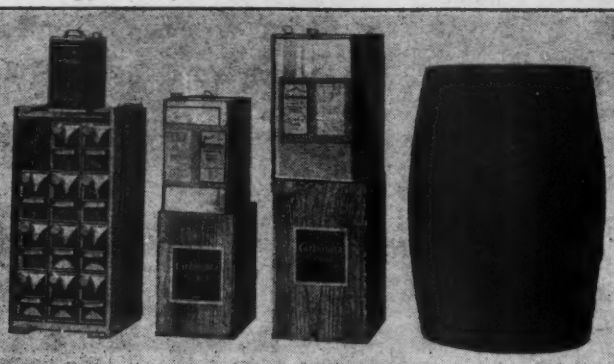
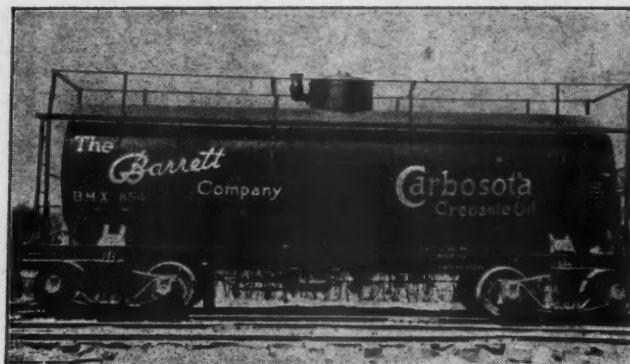
JANUARY, 1918

NUMBER 289

American Forestry



An Illustrated Magazine about Forestry and Kindred Subjects Published Each
Month by the American Forestry Association, Washington, D. C.



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AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

JANUARY 1918 VOL. 24

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THE ROYAL PALM.

The Palm is a Royal (*Oreodoxa regia*) growing in the Soar Nurseries, at Little River, Fla. F. J. McKinley, of Miami, Fla., who sent the photograph to American Forestry, says he believes it is the handsomest specimen of the Royal Palm in the United States. The seed from which this tree grew was shot down with a rifle from the parent tree, near Cape Sable, Fla. The tree is twenty-two years old and sixty-two feet high.



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AMERICAN FORESTRY

VOL. XXIV

JANUARY 1918

NO. 289

MAN-MADE PLAYGROUNDS

BY C. J. BLANCHARD

STATISTICIAN, UNITED STATES RECLAMATION SERVICE

THE West has so much to offer in the way of beautiful and inspiring scenery that additions to the infinite variety of its natural attractions seem almost superfluous. Its countless lakes, snow-capped peaks, stupendous canons, spouting geysers, tumbling cataracts, primeval forests, broad vistas of silent desert, and innumerable ruins of a civilization older than written history, constitute a galaxy of unrivaled allurements and charm. A lifetime is all too brief to acquaint oneself with the work a master hand has wrought in the great West. Man, however, has not hesitated to try his skill against the forces of nature in the conquest of aridity, and in so do-

ing has added here and there a number of gems to the sum total of our western wonderland. The "Home of Great Silence" now pulsates with life. Quickened by the magic of stored waters the ashen wastes have changed to green fields and blossoming orchards. The engineer has wrought better than he knew. While the controlling thought which directed his labor was to give the Desert to drink, it has so happened that he has given the people a playground which invites the husbandman and his family to rest and recreation in the intervals between his heavy labors in the fields. Gradually with the lessen-



THE WONDERFUL BEAUTY OF EVENING ON LAKE KEECHELUS

In the Wenatchee National Forest, Washington, this picturesque body of water is completely surrounded by heavily wooded mountains. Along one side of the lake the Forest Service has constructed a splendid highway, a part of the state boulevard system from Seattle to Spokane. At the outlet of the lake the reclamation engineers have built a high earthen dam, which greatly increases the storage capacity. The lake constitutes an important feature of the Yakima project, one of the richest irrigated areas in the world. The annual products of this valley which depend for water supply upon this and other lakes in the Cascades have a gross value of \$20,000,000. Under a wise policy of conservation and use, the Forest Service has laid out a number of villa sites for summer homes, many of which each year are occupied by citizens of the state.

ing of the severe task of reclaiming the desert, and with the prosperity which follows bountiful harvests, has come an appreciation of the value of these beautiful lakes nearby. The summer pilgrimage of vacationists, fishermen and seekers of health grows each year. Hotels, villas and tent cities now dot the picturesque shores and in the water are innumerable boats of all descriptions. Many of these lakes are well stocked with fish, and all are wild bird refuges. The highways leading from the desert valleys to these resorts are excellent and are traversed by thousands of autoists and campers.

Up to the present time the Reclamation Service has contributed 29 artificial lakes of this kind. Its structures on 14 natural lakes have lessened the fluctuations of water levels and rendered these lakes more useful for resort purposes.

First in completion and by reason of the wide publicity which was given to the great work which created it, probably the best known of the artificial lakes of the service is the Roosevelt reservoir in Arizona. This great body of water was impounded by the construction of the Roosevelt dam, an enormous structure of masonry wedged in a narrow canon of Salt River, at a point just below the confluence of Salt River and Tonto Creek. The dam, which is 280 feet high and 1,080 feet long on top, floods a broad basin having an area of 25 square miles. The lake lies in the heart of the Sierra Ancha Mountains, in a region of wonderful coloring and beauty. It is one of the principal attractions on the famous Apache Trail, which traverses a country rich in historical interest and full of the crumbling ruins of vanished

races. In the canons of the nearby mountains are the homes of the cliff dwellers, concerning whose history we know so little.

The Forest Service is building trails to make accessible many of these ruins which, up to the present time, have never been visited by the white man.

The lake, now well stored with game fish, is a favorite resort for the angler. Prosperity undreamed of before the Government irrigation became a reality has rewarded the dwellers in the desert valley below, and their appreciation of this

beautiful inland sea is evidenced by a constant increase in the number of visitors each year.

Famous in the engineering circles of the world by reason of its enormous capacity, is the Elephant Butte Reservoir in New Mexico. It is the largest storage basin for irrigation in the world. Spread over Connecticut, it would cover the entire state ten inches deep. Located in the Rio Grande Valley about 120 miles north of El Paso, this lake is the only extensive body of water between Galveston and Los Angeles. Good auto roads have been built through the irrigated valley lands and for



LAKE McDONALD AND THE MISSION RANGE, FLATHEAD INDIAN RESERVATION, MONTANA

This emerald gem snuggles close to the beautiful Mission range with tiny glaciers clinging to their steep slopes. Up to a very recent period the region has been quite inaccessible, and for that reason is but little known. The development of a large irrigation project and the building of a railroad will make this delightful section of Montana the summer playground for many people. The lake is utilized as a storage reservoir for the irrigable lands in Flathead Valley, but care has been taken to preserve all its natural charm and beauty.

many miles the route is across the weird and mysterious Jornada del Muerto, whose milestones are the bones of the early Spaniards. The Journey of Death, as the first white people called it, is now made in a few hours.

Elephant Butte Dam is located in the canyon just below the black basaltic butte from which it takes its name. It is one of the world's great structures, being 305 feet high, and 1,400 feet long on top. The lake created by it covers about 5 square miles, and is picturesquely set among the hills and detached buttes which conspicuously



REFLECTION ON LAKE TAHOE

The lake abounds in beautiful scenes for the photographer. The rugged Sierras culminating in snow-clad peaks, the numerous bays and inlets, forests of noble pines reaching down to the water's edge, the marshy margins decked with the aspen, which are mirrored in the quiet pools, furnish an infinite variety of scenes for the artist and camera man.

characterize the region and which add so much to the beauty of the shore line.

The elevation of the lake is 4,500 feet, insuring pleasant days and cool summer nights, and making the resort extremely popular with the dwellers in the hot valleys below. The possibilities of this reservoir as a playground were recognized by the Reclamation Service, and in the construction of its camp many buildings of a permanent nature were erected. With the completion of the engineering work these buildings have been made available for the visitors, and the accommodations are excellent and adequate for all present needs. There are numerous pretty cottages and bungalows, a commodious hotel and dining hall, all electrically lighted and with modern conveniences. Boating, bathing and fishing are the principal sports.

The genius of the engineer restored to Wyoming a beautiful lake which had existed there in early geologic times. During a remote period in the world's history the upthrust of a huge wall of granite through the sandstone formation of northern Wyoming completely blocked a section of the valley of the Shoshone River at a point just below the confluence of the North and South Forks. This natural dyke backed the water for miles, covering a level flooded valley to a great depth. Gradually the waters rose and topped the dyke, spilling the surplus over the rim. During recurring centuries the waters gradually eroded a channel deeper and deeper into the

granite, until it became a canon, the bottom of which is below the bed of the lake. The lake bed dried up and became once more a broad, grassy valley on which later grazed innumerable buffalo, elk, and deer. For many years it was a favorite hunting place for the red man. Its importance as an agricultural region, and its numerous charms as a resort for the hunter and fisherman, were first made known by Buffalo Bill, who became fascinated by its beauty during one of his numerous Indian campaigns, and who finally selected it as a location for a ranch and home. His vision and determined personality are largely responsible for the important developments which have taken place here in the past twenty years. He lived to see his faith in the country vindicated, for it is today the richest agricultural part of the state, and the most prosperous.

To make his dreams come true it was necessary to recreate the lake of olden times, and in so doing the ranches of Buffalo Bill and his neighbors in this mountain valley were completely submerged. To accomplish this a wonderful dam was built in the granite canon, a structure of concrete 328 feet high. A lake has been formed covering an area of 10 square miles to an average depth of more than 100 feet. It is a beautiful sheet of water, rimmed on all sides by lofty mountains, covered with primeval forests. In the construction of the dam the service built a remarkable highway up the canon which has now been extended 75 miles into Yellowstone Park. The



AN EVENING STUDY OF THE ARROW HEAD

On Upper Klamath Lake, Oregon, this shows the reflection of Pelican Mountain. The lake is noted among the disciples of Walton as the home of big trout. Its waters are of wonderful clearness, and the reflections of mountains and forest clad shores are of extraordinary beauty. The Forest Service has laid out a number of attractive villa sites, and each year the number of visitors is increasing. Surrounding the lake are vast areas of valuable timber, much of which is included in Crater National Forest. The surplus waters of the lake are diverted into huge canals, and irrigate the beautiful valley of the Klamath below Klamath Falls.



LOWER TWO MEDICINE LAKE, ON BLACKFEET INDIAN RESERVATION, MONTANA

One of the attractions of Glacier National Park, and serving at the same time as a reservoir for irrigating 50,000 acres of Indian land on the Reservation. In a region of inspiring scenery, this lake suffers not by comparison with numerous others found in this popular national playground of the Northwest.



JACKSON LAKE, ON THE BORDERLAND OF WYOMING AND IDAHO, IN THE HEART OF THE BIG GAME COUNTRY

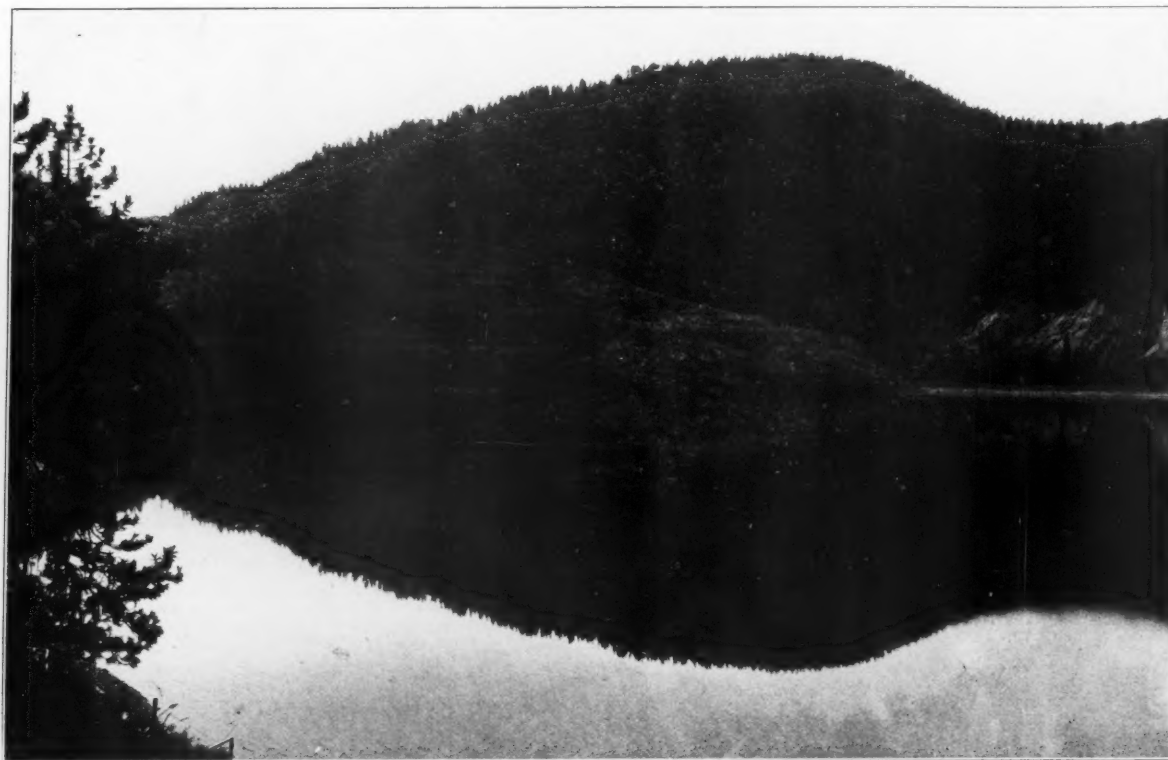
One of the most beautiful sheets of water in the United States, its remoteness from railroads has left it almost unknown to the general public. On its placid bosom the lofty Tetons are reflected with wonderful clearness and detail. This lake, now utilized by the Service as a storage reservoir, contributes to the reclamation of half a million acres of the richest land in Southern Idaho. It is one of the most important storage basins utilized by the Government.

Cody Way into our national playground has today become the most popular auto route and one of its principal attractions is the Shoshone Lake.

Owing to the nearness and accessibility of the National Park the lake has not been utilized to any considerable extent by the people of the Shoshone Valley. It is believed, however, that this condition is only temporary.

Arrowrock reservoir, a deep lake formed by closing a canon on Boise River with the highest dam in the world, waits only the construction of a good highway to become a summer playground for the citizens of the capitol city.

In Nebraska Lakes Alice and Minatare, subsidiary storage systems for the North Platte project, are stocked



CONCONULLY RESERVOIR. DEEP BOSOMED IN THE FOOTHILLS OF THE UPPER CASCADE MOUNTAIN

This man-made lake has all the charm and beauty of one of nature's best productions. It was created by the engineers of the Reclamation Service, who built a long earth dam to close a depression in the hills, catching and storing therein the drainage of the nearby mountains. The valley far below, which has been transformed from sagebrush desert into a rich and productive country, is known as the Okanogan project, containing 10,000 acres, most of which is in bearing orchard. The reservoir and the numerous streams flowing into it are well stocked with trout.

When the broad valley below is fully reclaimed thousands of its people will find enjoyment on the shores of the reservoir.

In Idaho three artificial lakes, Arrowrock, Deer Flat and Wolcott, already are contributing greatly to the summer enjoyment of reclamation farmers. Lake Wolcott, which acts both as a river regulator for power development and the conserver of flood waters for irrigation on the Minidoka Project, is located in a part of the state in which no other lakes are found. This large and beautiful lake is surrounded by many square miles of level country which up to a few years ago was virgin desert, but which today contains one of the most progressive and prosperous agricultural communities in the state. Excellent trout fishing is provided at the dam, and the lake is well supplied with boats of all kinds. It is the popular picnic resort for the thousands of people who have taken up their homes on the project.

Deerflat reservoir, situated midway between Boise and Caldwell on the Boise project, is well patronized during the summer months. It is accessible by auto and trolley.

with fish and are just beginning to attract the attention of the people of the valley. A movement is on foot to plant trees and improve the shores of these lakes, which offer the only opportunity for bathing, fishing and boating in the near neighborhood.

Owl Creek reservoir, the largest body of water in South Dakota, was formed by the construction of the dam from whence it takes its name. Located in a region notably lacking in lakes of any kind, this fine body of water is destined to become a popular resort for all western South Dakota.

On the Okanogan project in northern Washington, Salmon Lake and Conconully, by reason of their charming location in the wooded mountain areas, and their great natural beauty, are already utilized by hundreds of the residents of the valley.

As if by magic the engineers have converted a valley far up in the Wasatch Mountains into a splendid lake. By the construction of a dam in Strawberry River the floods were held back and one of the most attractive lakes in Utah was created. Stored waters from the lake

which is supplied by a stream which once emptied into the Pacific Ocean, are turned through a four-mile tunnel into Utah Valley, which has an outlet to the sea.

It is a real adventure to visit this lake, which is located so far from the centers of population, but it is an adventure well worth while. From the valley on the western side the Government road follows a brawling trout stream clear to its source in the snow banks. It is a scenic road of much charm and diversity, and attains an elevation of nearly 10,000 feet before we drop down to the lake on the eastern slope. The mountain views are most inspiring. There are no hotels or permanent camps on the lake as yet, so that visitors now must carry complete outfits and provisions. But the trip well repays all the troubles incident to making it. In the lake and the streams which flow into it are the largest trout in the state. Big, gamey rainbows from six to ten pounds in weight reward the skilled angler. The cool and bracing atmosphere of the high altitude is a tonic and a health restorer.

If space permitted, mention might be made of many other artificial lakes which are now, or later will be-

Umatilla project, Cold Springs reservoir, and in Wyoming the huge Pathfinder.

Lake Tahoe, in California and Nevada, the "Sapphire of the Sierras," is the great storage reservoir of the Truckee-Carson project in Nevada. No other lake and mountain resort in the West is better known or more popular with vacationists of the Pacific slope. Nor are its devotees confined to the West alone. Annually thousands of pleasure-seeking tourists from all parts of the country include Tahoe in their itinerary.

The lake is 6,200 feet above sea level, has a rugged shore line of 150 miles and is well supplied with modern hotels, lodges and camps. Its shores are dotted with the beautiful homes of wealthy citizens of California and Nevada.

The Klamath Lakes of Oregon are growing in popularity with the construction of state highways by California and Oregon. They are along the new route to Crater Lake National Park, and furnish a delightful resting spot for parties making the tour from San Francisco to Portland. The residents of Klamath Valley make general use of these resorts, which are well supplied with



LAKE TAHOE, CALIFORNIA AND NEVADA'S "SAPPHIRE OF THE SIERRAS"

A popular playground for thousands of summer tourists. Picturesquely located in the heart of the snow capped Sierras, in the Tahoe National Forest, Lake Tahoe ranks with the most beautiful and best known scenic resorts of the West. The lake is 23 miles long by 13 miles broad; its elevation above sea level is 6,240 feet, and its maximum depth is 2,000 feet. Its shores are dotted with excellent hotels, numerous villa and camp sites, and the artistic homes of California and Nevada millionaires. Aside from its usefulness as a popular resort, the lake is now being made to serve as the regulating reservoir for the irrigation of nearly 200,000 acres of Nevada's dusty desert. Formerly all the overflow of the lake emptied through Truckee River into a desert sink and evaporated. Today this water is making fruitful thousands of acres of reclaimed land.

come, playgrounds of our farmers and townfolks. In New Mexico, on the Carlsbad project, are Lakes Avalon and McMillan. In Montana, on the Sun River project, are Pishkin and Willow Creek reservoirs; on Milk River, Lake Nelson; on Flathead and Blackfoot are five reservoirs; in Nevada, Lake Lahontan; in Oregon, on the

camp sites and hotels. Boats ply between the various points, and the social pleasures during the summer months are numerous and varied. The streams and lakes are full of fish and in season the shooting of wild fowl is excellent.

The Yakima project in Washington is blessed with

three charming mountain lakes which are also utilized as storage basins for irrigating the pleasant valley below. These lakes, Kachess, Keechelus and Clealum, are in heavily wooded country, easily reached by auto and good roads. The Sunset Highway, constructed by the state, follows the shores of Keechelus and makes the lake a short journey only from Seattle and Tacoma. Many beautiful camp and villa sites have been laid out by the Forest Service, and a cordial invitation is extended to linger in the midst of these attractive scenes. The camps are supplied with running water, telephones, and auto supplies are readily obtained.

In Montana, St. Mary, Sherbourne, Two Medicine and McDonald Lakes are storing waters for thousands of acres of valuable farm land. At the same time the beauty of these lakes is not marred by the engineering structures, and their utilization for recreational purposes is not interfered with. Several of these lakes are wholly or in part in Glacier National Park and are visited by thousands in the season.

Near the boundary line of Wyoming and Idaho, in a

region of unrivalled scenic beauty, is Jackson Lake. Located in the midst of the lofty and impressive Teton range, remote from railroads, and without good roads, this lake has remained unknown except by those who ventured far afield in quest of big game. Plans are under way to include the lake in a new highway into Yellowstone Park. When completed a new wonderland will be made available. In sublimity and grandeur of scenery there are few places in the world which equal the Jackson Lake country. Its stored waters are contributing to the development of nearly 400,000 acres of land in southern Idaho.

National reclamation, once regarded as the dream of the visionary, has become a triumphant reality. It has made productive a million acres of worthless desert. It has established in homes of their own 200,000 people, and its annual contribution of crops totals more than \$33,000,000. The economic value of its contributions to our scenic and recreational playgrounds cannot be measured in dollars and cents. Their contribution to health and pleasure is just as important.



IN GOD'S CATHEDRAL

DONALD A. FRASER

In God's cathedral there is naught but praise;
 The columned firs uprise in stately length,
 And bear the azure vault with quiet strength,
 Their plummy capitals in light ablaze.
 Below, in shade, the younger hemlocks raise
 A pale green mist, like incense-smoke that must
 Bear upward from repentant, yearning dust
 Some prayer for pardon and for hope that stays.
 The faithful ferns have spread their pleading palms,
 And listen as the organ-wind resounds,
 While choral birds chant sweet their holy psalms;
 All passion flees, and peace alone abounds.
 To God's cathedral bring no jarring tone;
 Heart of my soul, bow thou before the throne.

BIGGEST REGIMENT BECOMES BIGGER

FROM the original plan for the largest regiment in the world, the Twentieth Engineers (Forest), has undergone expansion which materially augments its superiority of numbers. At the outset the War Department provided for the formation of a regiment of 19 battalions and a total strength of approximately 17,000 officers and men. The beginning of the new year found this plan extended to include three additional battalions which will bring the muster roll close to 20,000.

The three battalions which have been added are made up of road and bridge builders. The necessity for organized forces of this character is as great as the need for foresters and woodsmen. The new battalions will provide the allied troops with engineers and construction men experienced in road and bridge building and repair work. These men will devote their time to the maintenance and repair of existing roads and bridges and construct such others as are required for military purposes. They will work in co-operation with the ten battalions of foresters and woodsmen and the nine battalions of laborers contemplated in the original plans for the Twentieth.

Rapid progress is being made in the organization of the regiment. The first and second battalions went across the ocean in the autumn and are now in the forests of the French war zone. The third and fourth battalions were completely organized in mid-December. Before January 1 the fifth and sixth battalions were also ready for service and work was proceeding on the organizing of the seventh, eighth, ninth and tenth battalions.

The operations of the soldiers engaged in forest and lumbering operations for the armies of the United States and the Allied Nations are by no means confined to the forests and lumber camps of the French war zone. There has been brisk recruiting for the organization of the Spruce Production Division of the Signal Corps. The duties of this division are to get out spruce and fir for airplane stock, in connection with the plans of the War Department to construct 22,000 flying machines for immediate use. The production of this lumber in the Northwest has been hampered by the agitation and activities of the I. W. W. in the lumber camps. It was to overcome this handicap that the Spruce Production Division was organized.

At the turn of the year it was announced that 10,000 soldiers were being sent into the northwestern woods with this division. The men have volunteered from western encampments of the National Army, from other services and from civil life. Their operations have already resulted in speeding up the production of airplane lumber. A monthly output of fifteen million board feet of spruce is required to meet the extra needs for the aircraft production program.

In connection with the needs of the French forests for immediate attention it is announced that the United States will ship large quantities of young trees to France for transplanting. The havoc wrought by long-continued

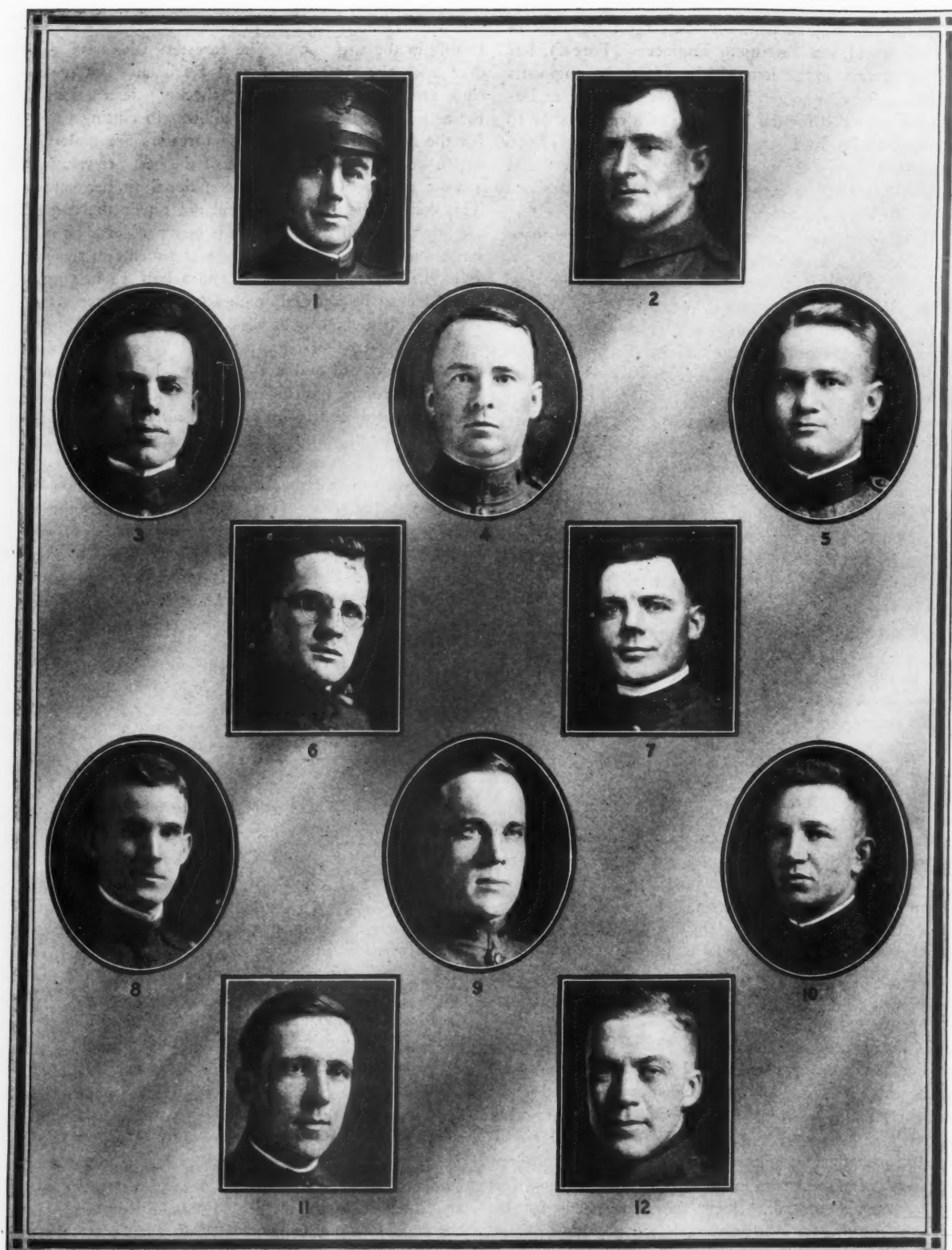
warfare has been such as to imperil the future of the forests in the war zone. The foresters who have gone over with the American Forest Regiments are paying close attention to the need for checking destruction, as far as military operations will allow. In cutting timber for the army lumber camps the foresters are undertaking to save as much as possible of the best growth, with a view to perpetuation of the national timber supply. This conservation, however, will not repair the damage already done and reforestation is being undertaken on a large scale. One of the first announcements in this line is to the effect that a million and a half French prune trees are to be shipped immediately to France to rehabilitate fields and orchards devastated by the Germans in some of their "strategic retreats." The trees selected are two years old and it is understood that other shipments will follow the original 1,500,000.

In sending these trees to France, California is indulging in a pretty bit of sentiment as well as giving practical contribution to the French people. The original prune trees in California imported from France and in thus sending some of the offspring of the early importations the Pacific Slope is restoring the trees to their native soil. The first importations to this country were in 1856. Since that time the prune orchards of California have spread steadily until they now cover an area of close to 100,000 acres, with an annual crop yield of over ten million dollars.

A letter just received from an officer of the Tenth Engineers (Forest), in the French war zone tells of the regiment's need for sweaters and other supplementary articles of clothing. "Up to date," the letter says, "the weather over here has been very mild, with scarcely any freezing, and the men have therefore been very comfortable. We are, however, quartered in tents heated by 'Sibley' stoves, and probably will be all winter. Therefore, anything like sweaters, scarfs, or wristlets will be appreciated, even in the tents.

"I have about a hundred men operating on a large estate, and so far we are getting excellent results. The personnel of this detachment and, as you probably know, of the whole Tenth Regiment, is very high. The men have cleaned out a large barn and made a Y. M. C. A. out of it, or as they call it, a 'Ladies' Rest Room.' They have hired a piano, and as several of the men play the piano and other musical instruments, this will help to make cheerful many of the long winter evenings."

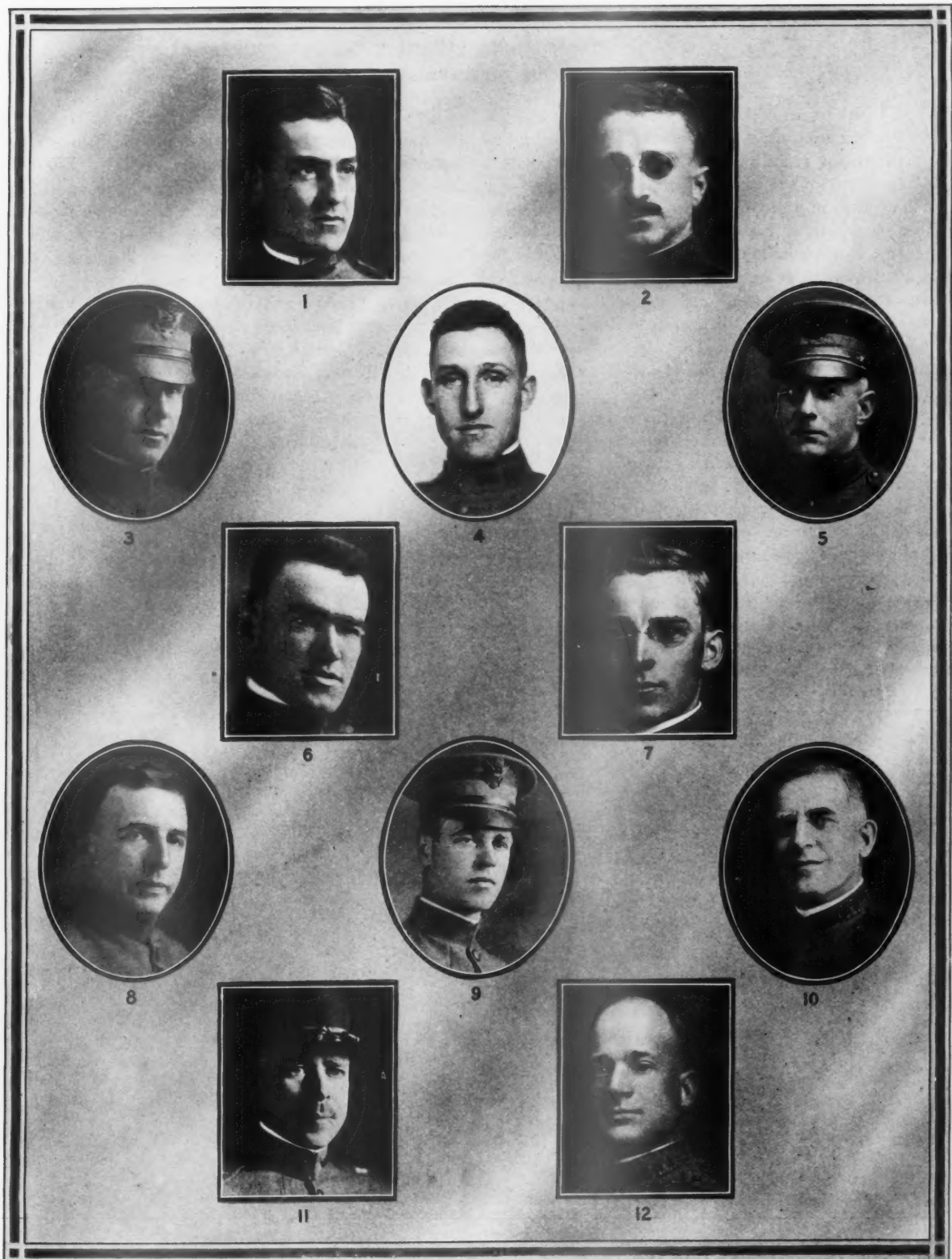
The United States Forest Service has issued a bulletin declaring that there is an emergency need for all the sweaters that can be made, for the two Forest regiments. Sweaters and other knitted articles in considerable numbers have already been sent forward but the demands are in excess of the supply. Contributions to the Lumber and Forest Regiments Relief Funds are urgently needed for the purchase of wool and other phases of providing for men of the regiments. Remittances may be made to the American Forestry Association, Washington, D. C.



Photographs by Harris & Ewing.

AMERICAN FORESTRY'S PORTRAIT GALLERY OF OFFICERS OF THE TWENTIETH ENGINEERS (FOREST).

1. 2d. Lt. William A. Foster. 2. 1st. Lt. Clement C. Abbott. 3. 1st. Lt. E. B. Hamilton. 4. Capt. Earle P. Dudley. 5. 2d. Lt. Fayette L. Thompson. 6. 1st. Lt. Leroy A. Schall. 7. 1st. Lt. Fred A. Stone. 8. 1st. Lt. Robert B. Hill. 9. 1st. Lt. John Summerset. 10. 1st. Lt. R. N. Benjamin. 11. 1st. Lt. Charles P. Hatrick. 12. 2d. Lt. Albert L. Shellworth.



Photographs by Harris & Ewing.

AMERICAN FORESTRY'S PORTRAIT GALLERY OF OFFICERS OF THE TWENTIETH ENGINEERS (FOREST)

1. 1st. Lt. Harold T. Antrim. 2. 1st. Lt. Alexander H. Ellison. 3. 1st. Lt. Charles M. Jenkins. 4. 1st. Lt. Henry F. Power. 5. Capt. Edwin C. Wemple. 6. 1st. Lt. Morton Van Meter. 7. 1st. Lt. Marion Nine. 8. Capt. Oliver J. Todd. 9. 2d. Lt. Earl B. Birmingham. 10. Capt. W. D. Starbird. 11. Capt. Andrew J. Fisk. 12. 1st. Lt. Herbert L. Holderman.

FORESTS INDISPENSABLE IN WAR

BY J. W. TOUMEY

DIRECTOR OF THE YALE SCHOOL OF FORESTRY

VICTORY is with the army whose country has the greatest iron mines and smelters, the largest areas of waving grain and an abundance of wood. Of all the products of the soil upon which the very life of a nation depends in times of war, wood is the only one that cannot be rapidly increased under necessity and by the employment of adequate labor. Therefore, provision for adequate national defense necessitates the maintenance of vast reserves of timber throughout the nation, reserves from which billions of feet can be drawn in a single year if necessary to meet the needs of the army and navy.

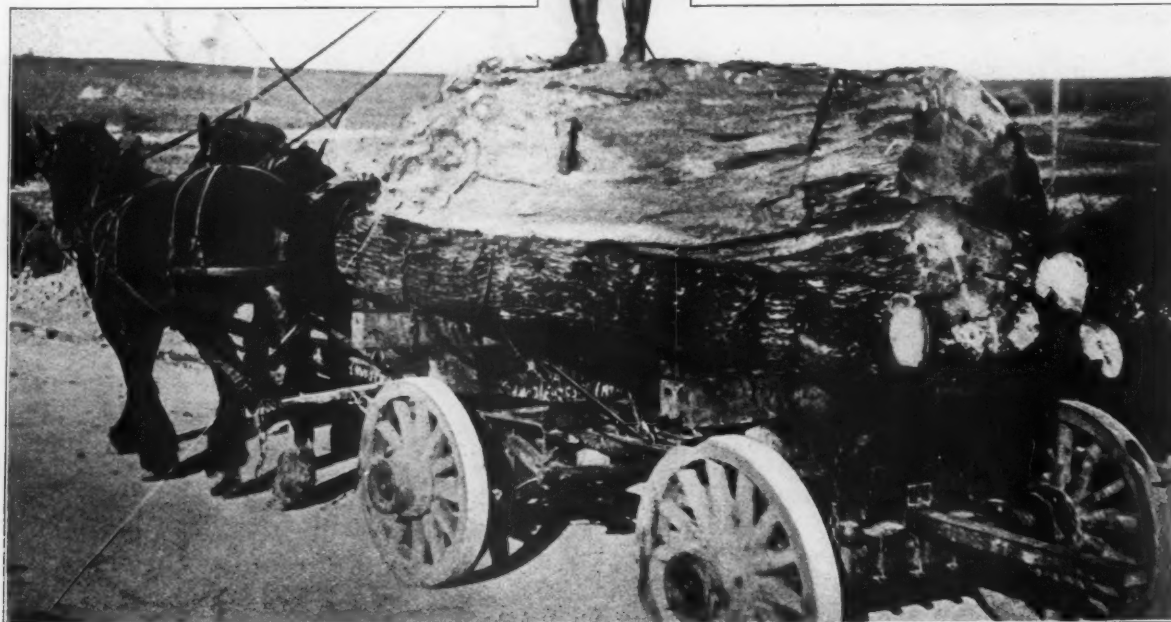
A sane and conservative development of forest resources to meet the needs of the nation in times of peace necessitates a constantly increasing intensity of management of all absolute forest land and the building up and maintenance of an enormous forest capital. Please remember this forest capital can be drawn upon in times of war and may determine the fate of the nation.

England has for centuries neglected her forests and for generations has obtained most of the wood used in her buildings and industry from beyond the sea. The stress of war found her with a meager forest capital, and New England's sons, are today felling the remnant of the forests

of that proud country that the empire may live. When the somber clouds of war are lifted from Europe's battlefields and peace again rules over the earth, England's lesson, learned in this bitter strife, will be taken to heart by her people and forests will clothe her idle lands. A forest capital, far beyond that of former days, will not only add to her economic development in times of peace but be developed and maintained to better insure her against vital needs in times of possible future strife.

France has been more far-seeing in her forest policy and, next to Germany, has been the most successful nation in Europe in the economic development of her non-agricultural lands for the production of timber. When the war broke out she had a forest capital that under the necessity of strife could be drawn upon for vast supplies of wood necessary for mining, transportation and trench construction, all vital to her very existence. If the French had had no forests at the outbreak of the war France would be devastated today and the nations of middle Europe feasting in the halls of Paris.

Even Russia, that great country of the North, awakened from her sleep of centuries and now



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AN AMERICAN LUMBERMAN AT HIS WORK IN FRANCE

In the uniform which represents the Stars and Stripes this able-bodied Yankee is carrying on his share of lumber work in the French war zone. He is typical of the men who have gone to France with the regiments of foresters and lumbermen. The work of these men is making possible a supply of construction material for the Allied forces which could not be procured otherwise. Of similar importance is the fact that trained foresters are preserving the French forests for future generations and at the same time facilitating the harvesting of the immediate supply.

laboring in the throes of a new nationalism, is calling for regiments of American foresters and woodsmen to hurry wood from her forests to the front and to centers where it can be utilized for war purposes.

A regiment of American foresters and woodsmen is already in France. Other regiments are being formed to be sent as soon as equipped and trained. Thousands of foresters trained at Yale and elsewhere and woodsmen trained in every forest from the Atlantic to the Pacific and from Canada to the Gulf will soon be busy

Sea to the Swiss border. Rumors come to us that much of this great forest has been cut for war purposes. In my opinion the products from the Black Forest have been a dominant factor in holding the German lines. It is entirely possible that it has been a controlling factor. Without them or other supplies of German wood, the invaders would have been swept from foreign soil long ago. Now we are told that the world war is straining Germany's timber resources beyond the breaking point. As I look back to those wonderful stretches of forest in



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AMERICAN LUMBERMEN AT WORK IN THE WAR ZONE

Much of the work behind the British and French lines is being done by American Foresters and Lumbermen of the Tenth and Twentieth Engineers (Forest). This picture shows some of the American workers engaged in the erection of a military structure. The picture is an official photograph of the British government and shows operations on the British front. Before spring there will be several thousand additional Americans in France with the Twentieth.

behind the western front, hurrying wood from the forest to the front.

The products of French forests back of the English and French lines are destined to continue a dominant force in the Allied victory which we all pray for and which every patriot believes in and is ready to fight for and if necessary die to attain.

The reconstruction of France after peace again reigns over the earth will cry aloud for the rehabilitation of her forests, that her forest capital, exhausted by the war, may be re-established, may again be a potent factor in her industrial development and a great, commanding asset in national defense.

Germany, at the outbreak of war, had a vast forest reserve, developed through generations of fostering care and careful management. Her wartime demands for timber, like that of the Allies, have been very great. Her famous Black Forest, so near the western front, is playing a prodigious part in the war drama from the Black

Baden and Wurtemberg, known for centuries as the Black Forest, with their great shafts of spruce and fir, with their splendid roads, their attractive inns and wonderful productiveness, I wonder if all the beauty is gone. Has the Black Forest gone down before the ax and saw? I fear it has, and with the removal of the trees has disappeared its chief attraction for the coming generations.

Our own great nation, 3000 miles from the blood-stained fields of Europe, is now calling for tremendous quantities of wood for the needs of the army and navy and for the use of our Allies. The Federal Shipping Commission alone will require more than 1,000,000 feet of the choicest timber to be found, and the construction of barracks and other buildings for the use of the vast army that we are now training and equipping will require about as much more.

Only a few weeks ago I visited one of the many shipyards in Portland, Oregon. At this yard a fully

equipped wooden ship was slipping from the ways every four weeks. A million feet of the choicest wood went into each of these ships. Scores of shipyards, both on the western coast and in the East, are searching the country for wood acceptable for shipbuilding and taxing the sawmills to their capacity for timbers suitable for their purpose. Each of the cantonments now approaching completion has required more wood for construction than that required for a modern town of 10,000 population.

This nation, fortunately, has vast reserves of virgin timber which, if need be, can supply all our own requirements for national defense and provide necessary supplies for our allies. A few weeks ago English and French

many ways, and now we are learning in this great world war that the nation having within its boundaries forests adequate to supply the excessive demands of war, without completely jeopardizing the needs that must necessarily arise during the period of reconstruction after the war clouds drift away, is not only stronger in war, but necessarily must be stronger in the upbuilding of the nation. This great world war is showing us more clearly than heretofore the great importance of forest conservation. It is giving us a new light. It is showing us the great need of the forest in national defense.

In time our virgin forests with their vast resources of timber will disappear. With their disappearance are we to lose this important asset in times of peace and indis-



Photograph from Underwood & Underwood, New York.

WOMEN OF ENGLAND AT WORK AS LUMBERMEN

As a result of the war's drain on Great Britain's man power women have been drafted into work heretofore regarded as exclusively for men. The sturdy girls here pictured are securely fastening a load of logs on the big lumber truck. Woman's adaptability is shown by the quickness with which they learn to make the loads secure and able to withstand the jars of the rough roads over which the hauling is done.

agents were in Washington and Oregon seeking supplies of Sitka spruce of the choicest grades for their great air fleets. More than \$100 per 1000 feet b. m. was offered for the product desired.

Without timber in abundance this nation would be today like a mighty giant without arms. I beg you to remember that scarcely an article of commerce is produced or brought to its point of utilization without the use of wood in some process of its production, manufacture or transportation. We have already learned that there is no other natural resource that has anything like so widespread an influence as the forest, that so intimately touches the daily life of so many persons in so

pensable asset in times of war, or are we to keep our vast forest property intact by protecting it and by organizing our absolute forest land for successive crops of timber as our virgin stands disappear?

Forestry is defined in its expression. American forestry is not the theoretical dissertations of technicians. Attempt to define it today and before your definition is completed it will have moved forward into something else. American forestry is what the public wills it to be. Its movement forward into what it ought to be in order to best serve the public, both in times of peace and in times of war, is attained by all of us thinking about the right thing to do with our forests until we want to do

the right thing. Then if we do the right thing long enough it is a perfectly natural consequence that good forestry becomes the gift of each generation to succeeding ones.

The war is bleeding Europe dry of the forest growth of a century. England, whose chief dependence for wood for two centuries has been beyond the seas, is destined to be stripped as bare as China before the end of hostilities. She now sees her great mistake in the neglect of her absolute forest lands and the great economic advantage in times of war when lumber-laden ships are swept from the sea, in having adequate reserves of lumber. Many decades must pass after the dawn of peace before Great Britain can re-establish productive stands of timber. She has learned her lesson, and her meager and scattered forests and neglected absolute forest land of the past will, I believe, give way to a glorious renaissance and a development of well-managed forests beyond even the dream of the past.

The well-managed forests of France in those parts of the country not devastated by the nations of middle Europe are being depleted with startling rapidity. The

These lessons of the great war that so clearly show the necessity of forests for the existence of national life should be taken to heart by the people of America. Our slogan should be, "Make the land productive." This slogan should ring from every schoolhouse, from every board of trade, from every organization from Maine to California that is striving for the betterment of the nation.

Not only should America work toward the conservation of her forests in all of her mountain areas, but the patriotism of the farmer should find expression in making the woodlot a far more productive part of the farm than it has been in the past. At this time of national stress and emergency, when every resource of the nation is scrutinized and adjusted to take its place in national defense, the American woodlot should not be overlooked.

The serious shortage in coal which confronted us during last year crippled transportation, curtailed the output of factories and worried the householder. The pinch is being felt even greater the present year. When coal, particularly for domestic purposes, is



Photograph from *Underwood & Underwood*, New York.

THESE WOMEN FILL THE SHOES OF MEN WITH SUCCESS

Reports from England show that the women who have turned lumberjacks in the British forests are doing the work as though they had been accustomed to it all their lives. The women wear knickerbockers and heavy leggings and are always ready for every branch of the work of lumbering. In this picture two of them are shown dispatching timber from forest to sawmill. They work quickly and skilfully.

French, however, with the assistance of American foresters, are felling the forests with an eye to the future and the securing of reproduction so that when peace comes the reconstruction will bring back the production of the absolute forest lands to their normal capacity. The forest capital of all Europe will, however, be enormously cut into when fighting ceases and the not over-abundant forest resources of the rest of the world will be required to rebuild Europe.

short, wood, to a very large extent, should be substituted for it. It may be necessary to make this substitution in many parts of the country during the winter. Two cords of hard wood are about the equivalent of a ton of anthracite coal. If found necessary, the farmers' woodlots can save the transportation and consumption of several million tons of coal. Let us hope that the nation can get the coal needed, but if mining and transportation break down the

millions of acres in American woodlots stand ready to supply fuel for our needs. The London Times recently said of the lumber situation in England:

In December a meeting was held at Westminster, England, to consider the question of native timber supplies for the war. It was called by the English Forestry Association and the Royal English Arboriculture Society. J. B. Ball, Controller of Timber Supplies, express-

lion were used for coal-mining purposes, the remainder being sawn timber and a percentage of ash and oak.

The requirements of the coal industry were enormous. For the production of 250 million tons of coal per annum, it was estimated that 3½ million tons of pit props and pit wood were required. In regard to the output of sawn timber, Mr. Ball said he hoped that during next year they would be able to produce 300,000 standards.



Photograph from *Underwood & Underwood, New York.*

ENGLAND'S WOMEN LUMBERJACKS AT WORK IN THE FOREST

In England the wartime activities of women include every phase of lumbering. They undertake and accomplish satisfactorily the entire process of converting the trees into lumber. As wood choppers they show remarkable skill and in the other phases of the work they are no less successful. The workers are popular in the district in which they work and they are looked upon as important factors in helping England to win the war.

ed satisfaction at the readiness with which landowners had placed at the disposal of his department various woods. At the outbreak of war enormous demands were made on imported timber supplies for Army requirements, and in 1915, owing to the submarine warfare, it was decided that steps should be taken to utilize home-grown timber. At the end of May the present Timber Control was instituted, and it had purchased something like 75 million cubic feet of timber of all kinds, some of which had been handed over to colliery associations in order to enable them to carry on their work in the mines. Up to the end of October the average price paid was just 9½d. per cubic foot. In consequence of the demand, and the restriction of imports it was decided to scrutinize the purchase of standing timber over 300 pounds in value, and an order was issued to that effect. Such purchasers had to apply for permits, and 960 of these had been issued, and 100 were now under consideration. The quantity dealt with in these permits represented a total of 27 million cubic feet, of which 20 mil-

The demands for imported timber had brought about keen competition, which had resulted in big prices being asked for standing timber, and in order to prevent inflation, the Department had recently fixed the maximum prices. It had also issued an order in regard to Ireland, the object of which was to control the exports to Great Britain of native-grown Irish timber, and to prevent the exploiting by Englishmen of woods at the expense of the Irish home demand.

The Coal Controller was naturally interested in the price he had to pay for pit wood, and he was about to issue to the collieries a schedule which fixed the price they would have to pay. As to afforestation, his Department had no direct mandate to deal with it; but it seemed to him, he said, that there ought not to be any very serious difficulty in developing home-grown timber. It might be necessary to control further the user of home-grown timber in the same way that the Department had controlled the user of imported wood, but he declared he would be very loath to do it.

THE CUCKOOS

(Family Cuculidae)

BY A. A. ALLEN, PH.D.

Assistant Professor of Ornithology, Cornell University

TO ONE interested in the habits of birds, the members of the cuckoo family present some of the strangest paradoxes of all nature. Constancy and maternal devotion, symbolic of bird life, are replaced by promiscuity and parasitism, and the privacy of nest life, for which most birds risk the hardships and dangers of long migrations, are forsaken for a communal habit. The majority of Old World species build no nests of their own but lay their eggs in the nests of other birds, where they are hatched and the young brought up, by the foster parent. Some of the New World species called anis, on the other hand, build a common nest in which several females lay their eggs and share the duties of incubation, while a few cuckoos, and among them the common American species, do not depart widely from the normal habits of birds but build individual nests and raise their own young.

There are about 190 species in the cuckoo family, found all over the world, although most abundant in the tropics. About thirty-five species are found in the New World but only two of these, the black-billed and the yellow-billed species, are common north of Mexico. The road-runner, however, which is fairly common in some parts of the arid Southwest, likewise belongs to this family. The California cuckoo is but a large representative of the yellow-billed species, and the mangrove and Maynard's cuckoos, and the anis are tropical species which only occasionally wander to our Gulf coast.

In general, cuckoos are medium-sized, dull brown, gray, or black birds but there are some exceptions to this rule in the African golden cuckoos, and the violet and emerald cuckoos which are beautifully iridescent. Almost as strange as their parasitic habit is the simulation by many species of cuckoos, of the plumage of the smaller hawks and of the birds which they parasitize. Thus the common European cuckoo and the hawk cuckoos of Asia resemble so closely the common small sparrow hawk as to alarm all small birds by their approach, and the drongo cuckoos of India resemble the drongo shrikes which they parasitize, even to the extent of having the outer tail feathers curved outward, both birds being uniformly black.

The cuckoos are rather low in the scale of bird-life, lying between the parrots and the kingfishers. Even a superficial examination shows their difference from ordinary perching birds, because, instead of having three toes directly forward and one backward,

they have two forward and two backward as in the parrots and woodpeckers. This shows very well in one of the accompanying photographs.

Unlike young parrots, the cuckoos do not pass through a downy stage but are almost naked when hatched, being extremely ugly black-skinned little creatures with a thin scattering of threadlike feathers. The growing feathers remain in their sheaths until fully developed, so that, for a long time, their bodies seem encased in tiny lead pencils. When the feathers are ma-



BREAKFAST IS ABOUT TO BE SERVED

The cuckoos are extremely valuable birds because of their fondness for tent caterpillars and other hairy larvae. Young cuckoos soon learn the reserved manners of the adults and even in the presence of food do not forget themselves.

ture, the quills burst open at about the same time so that the change from the curiously mailed creatures to the light fluffy fledglings takes place in a few hours.

The common cuckoos of the Old World, and there are about a dozen similar species, ranging through Europe and Asia except Polynesia, are about ten or twelve inches long, brown or gray above and barred below, with long fan-like tails and pointed wings giving them a swift hawklike flight. As a result, they have been much persecuted by gunners and gamekeepers so that they have become very wary and are seldom seen even where their notes are a familiar sound.

The notes of the common European cuckoo, so familiar to everyone because of the old-fashioned cuckoo clocks, are always associated with the coming of spring, for the cuckoos are migratory, spending the winter in Africa and returning to Europe among the first of the spring birds. For this reason, in spite of their bad habits, they are great favorites. Thus Wordsworth wrote:

*"O blithe Newcomer! I have heard,
I hear thee and rejoice.
O Cuckoo! Shall I call thee Bird,
Or but a wandering voice?"*

The birds parasitized by the cuckoo include most of the species smaller than itself whose nests it is able to discover. Apparently the egg is not laid directly in the nest, for many reliable observers record having seen the cuckoo deposit its egg on the ground and then carry it in its bill to the selected nest. The eggs of the cuckoo are small for the size of the bird, but larger than those of the host. They vary in color

from a dull greenish to a dull reddish gray with spots and mottlings of a darker shade. Some authorities declare that the color of the eggs is hereditary and that a cuckoo always parasitizes the species in whose nest it was raised and whose eggs its eggs most closely resemble. Other authorities disagree, however, and there is as yet no proof one way or the other.

However that may be, no sentiment is wasted, either by the old cuckoo or by the young, for once the egg is laid, the old bird never comes back to it, and when it has been hatched by the foster parent, the young cuckoo works the rightful young or unhatched eggs on to its hollowed back and heaves them overboard. The parasitized birds, except for some outcry at the first appearance of the old cuckoo, never seem to realize the calamity that has befallen their own young, but take pride in filling the cavernous mouth of the intruder.

In the New World cuckoos, the parasitic habit is not the rule, although all species are rather shiftless nest builders and occasionally drop their eggs in each other's nests or very rarely in the nests of other birds. Thus in the accompanying photograph of the nest of a black-billed cuckoo, the large egg is one of the yellow-billed species. Another evidence of a possible former parasitic habit among the American cuckoos, or a leaning in that direction, is that the eggs are not always laid at regular periods, one each day, as is normal with



AT HOME IN A THICKET

A black-billed cuckoo serves a spiny caterpillar to its expectant young. The deep shade of the vegetation makes the photography difficult.



AN INTIMATION OF PARASITISM

A nest of a Black-billed cuckoo containing three eggs of this species and one of the yellow-billed cuckoo. The American cuckoos are shabby nest builders but are not ordinarily parasitic as are the European species. However, they sometimes lay eggs in each other's nests. The larger egg is that of the yellow-billed species.

birds. Intervals of several days sometimes elapse and a nest may contain young birds and fresh eggs at the same time. The eggs of both species are pale greenish blue,

those of the black-billed species being smaller and darker.

The parasitic habit of the Old World cuckoos, however, is developed in the New World in a totally unrelated family, the Icteridae or blackbirds. In this group, the majority of species are expert nest builders and show all the constancy and maternal instinct of normal birds, but one rather large division, the Genus of cowbirds (*Molothrus*), has departed so far that, with one exception, the habits of its members are similar to those of the European cuckoo. There is this difference, however, that the eggs are laid directly into the nest of the smaller bird.

The American black-billed and yellow-billed cuckoos are very similar in general appearance, being long slender birds dark brown above and pure white beneath. The long tail feathers bear white spots at the tip, those of the yellow-billed species being the more conspicuous. These spots and the yellow lower mandible, are the most distinctive marks of difference.

Cuckoos frequent open wood lands or the borders of woods and some-

times come into orchards and gardens where they are of inestimable value because of their fondness for tent caterpillars and other destructive hairy larvae which, when full grown, are shunned by most other birds. They are usually shy and retiring and are very easily overlooked because of their habit of remaining absolutely quiet when at all alarmed. In

flying from tree to tree, they have a graceful sweeping flight but they seldom go long distances through the open. In keeping with their secretive habits, their migrations, which carry them to South America, are performed en-

tirely at night. This is a striking characteristic.

The notes of the two species are so similar that one cannot always distinguish between them. The song of the yellow-billed species has been represented by Dr.

Chapman as :
tut-tut, tut-tut,
tut-tut, cl-uck-
cl-uck, cl-uck-cl-
uck, cl-uck-cl-
uck, cow, cow,
cow, cow, cow,
cow, cow, cow.
The song of the black-billed species is somewhat softer and the cow-cow notes are usually not run together. The last part of the song is very similar to that of the mourning dove and indeed the bird is dove-like in many ways. A curious superstition declares



MURAL DECORATIONS

The lining of the mouth of young cuckoos is bright red with curious white excrescences, the exact function of which is not known. As the birds get older these are lost and the red color changes to a velvety black.



THE AMERICAN PARASITE

The American cuckoos are not parasitic like their European cousins but the cowbirds are, laying their eggs in the nests of smaller species. The male cowbird is black with a brown head, the female grayish black.

that their songs predict rain and this has given the name of "rain crows" to them in many parts of the country.

The anis, previously mentioned as having a communal habit, are among the most familiar sights of the West Indies and the open land and clearings of tropical America where they are known as "Savanna blackbirds" or "tickbirds." They are typically of the pastures where they sun themselves with wings half spread on the tops of bushes, or follow the cattle, catching the insects which they disturb in the grass or pecking the ticks from their backs. There are three species of anis, all of them uniformly black, with some metallic reflections, and with large compressed bills which give them a curious parrotlike profile. In other ways, however, they are far from parrotlike. They are weak fliers and their long tails are composed of but eight feathers, the fewest number of any birds.

When the nesting season arrives, each company builds a nest, usually in the top of a small tree. It is a bulky affair, about the size of a crow's nest, made of sticks and green leaves. In it the various females lay their

eggs and if there is not enough room for all the eggs, green leaves are placed over the first layer and the rest of the eggs are laid on top. The lower ones usually do not hatch and the upper ones are sometimes laid at such different intervals that fresh eggs and young birds are found in the same nest. The exact apportionment of duties between the females has not yet been discovered but it is believed they all help in incubating and in feeding the young.

Another curious and entertaining bird of the cuckoo family is the road-runner or "snake killer" of Mexico and the arid regions of our Southwest. It is sandy-brown in color, broadly streaked, and nearly half of its two feet in length is taken up by its enormously developed tail. Its long legs permit it to cover the ground without the use of its wings about as fast as a horse can trot. In fact it never flies unless hard pressed but often darts out into the road in front of a horse and easily keeps ahead until it gets



A DOUBLE IMPOSITION

A phoebe's nest, containing three white eggs of the phoebe and twospotted eggs of the cowbird. Young cowbirds, like young European cuckoos, usually crowd the rightful young from the nest.

tired out, when it disappears into the brush, throwing its long tail over its back to act as a brake.

The road-runner is omnivorous, eating caterpillars, beetles, cactus fruits, horned toads, lizards, snakes, and young birds with equal avidity. Many wonderful stories are told of its strangeways and perhaps its ridiculous appearance is sufficient ground for them. One has it that when a road-runner discovers a rattle snake coiled up asleep, it builds a corral of thorny twigs about it and then drops one upon the snake to awaken it. The startled snake thrashes about in its effort to escape,

fills its body full of thorns, and soon falls prey to its wily tormentor.

Its nesting habits are quite normal for it usually builds a rough structure of twigs in a thorny brush and lays from four to nine white eggs. Sometimes it utilizes the deserted nest of another bird. The young birds make fine pets and seem to become attached to their captors.



ARIAN CHRYSALIDS

Young black-billed cuckoos showing their curiously mailed appearance before the feather sheaths break. The transformation wrought by the breaking open of these pencil-like quills is nearly as sudden and wonderful as the change from chrysalis to butterfly.



A DAINY DEBUTANTE

The quills have now broken and the fluffy feathers have transformed the ugly little black creature into a charming debutante. To the person unfamiliar with these birds it would seem incredible that such transformation could take place as is here suggested.

A NATIONAL FOREST TIMBER SALE AND ITS PURPOSES

BY H. H. CHAPMAN

IN THE last annual report of the Forester, of the U. S. Department of Agriculture, the statement was made that the revenue from the last fiscal year derived from the sale of timber products from National Forests totalled one million and five hundred and eighty-one thousand dollars. A corporation with an annual income of this amount, would require a capitalization of at least fifteen million dollars, and would rank with the largest of our industrial organizations. The questions naturally arise, how is the Government managing this business, and are the interests of the public being fully protected, or is the timber being ruthlessly sacrificed for the sake of revenue, and the National Forests rapidly destroyed in the same manner as the white pine forests of the Lake States melted away, and as the southern yellow pine is disappearing?

No better way of answering these questions can be found than by describing the process by which a recent sale of western yellow pine in the southwest was consummated—a sale involving over 600,000,000 feet of timber in one body, and requiring a twenty-year period for the completion of the operation of logging and manufacturing the timber covered by the contract.

About five years ago an attempt was first made to open up an immense body of several billion feet of western yellow pine on the Sitgreaves National Forest in Arizona. This timber lies on a high rolling plateau bounded on the south border by a vertical cliff known as the Mogollon rim, which trends southeast from the Coconino National Forest where the Santa Fe railroad crosses it. Eastward the timber belt trends constantly farther away from the railroad and becomes more inaccessible until it terminates in New Mexico in a wilderness known as the Datil and Gila National Forests, one of the least developed portions of the entire United States. The Sitgreaves Forest occupies a long

section of this belt fully sixty miles from the railroad, and to the south, taking in the drainage in that direction, lies the White Mountain Apache Indian Reservation, equally well forested. North of the Forest lie the barren plains, while along the water-courses are a few small Mormon settlements, Snowflake, thirty miles from the railroad; Show Low, twenty miles further on, and others, dependent on wagon freight haul for transportation of

all exports or imports. These towns needed a railroad, but their resources and population were too meagre to justify the construction of a line. But there was one way in which this country could be opened up, and that was by logging and manufacturing the timber to make freight for the road. A small body of timber would not suffice. There must be at least 600,000,000 board feet to provide a continuous revenue for twenty years which would guarantee a fair per cent on the railroad investments, estimated to require one and one-quarter million dollars.

The timber standing upon the National Forest lands amounted to but 235,000,000 board feet, and when the cost of logging, manufacturing and marketing this quantity of timber was computed, and distributed over the investment required, it was found that the timber would have to be given away or the investors would lose on every foot of timber which they manufactured. But across the forest boundary to the south, on the Indian Reservation, lay 400,000,000 feet of the same kind of timber, separated only by a wire fence from the

timber on the Sitgreaves Forest. If the purchaser of the first body of timber could be assured of buying the Indian timber, the overhead costs of railroad, mill, logging roads, engines and all other equipments, amounting in all to \$2,000,000 when distributed over this large quantity of timber would be so reduced for each 1000 feet manufactured, that after paying a reasonable rate of interest to the purchaser, a margin of value would



SITGREAVES NATIONAL FOREST, ON THE AREA OF A BIG TIMBER SALE

This is a group of dying and dead veteran yellow pines, with reproduction just starting below them. Amounting to many millions of feet per year, this natural waste is saved by modern timber sale methods.

still remain. This margin, termed the stumpage value, is what the timber must be advertised and sold for by the Government. Thus by arranging a co-operative sale, not only would timber which must otherwise remain

ing. In the old days, this timber or a part of it would have been secured through the operation of the land laws, probably by speculators, who would have sold it to a lumber company with sufficient capital to both hold and develop it. Since the establishment of the National Forests, the Government retains title to both land and timber, and the operator can purchase it under contract which requires him to begin logging operations promptly and he can pay for the stumpage as logging proceeds. But he can neither buy and hold the timber for speculation, nor can he use it as a basis for floating stock and bonds and reaping a promoter's profit. The Government requires a purchaser to submit evidence of his financial soundness before the award is made.

In July of this year, application for the timber was made by residents of Arizona and New Mexico and after a joint examination of the area by officials of the Indian Service, the Forest Service and the applicants, an agreement was reached as to the terms of the sale. Identical contracts were drawn up for each Department, and the timber on the Indian Reservation and the National Forest was advertised for sale simultaneously, for a period of two months. Sealed bids were opened on October 24. It was found that but one bid had been submitted, and that was by the local men. A minimum price had been set upon the timber, representing its actual appraised value. The bid was for this price.

But before the sale could be awarded the successful bidder must show his hand. Evidence of subscriptions in cash of \$225,000 was submitted before the contract was executed and the bond and sureties signed.

Now the big project is actually under way. A new railroad grade is rapidly creeping south towards Snowflake; ties are being felled and hewn in the Forest, and a small saw mill is soon to be set up to cut out the timbers and lumber for the big mill, with its satellites, the



A FOREST SERVICE TIMBER SALE ON THE COCONINO NATIONAL FOREST

The cutting is completed and the logs are bunched for hauling. The stand of timber shown is left for future growth and seed production.

unused because no one could afford to log it be given a value and produce a revenue to the Government, but the much desired railroad would become an actual

Indian Service, the Forest Service and the applicants, an agreement was reached as to the terms of the sale. Identical contracts were drawn up for each Department, and



REPRODUCTION OF WESTERN YELLOW PINE

This stand is already established, as the direct result of fire protection and regulated grazing. A sale area on the White Mountain Apache Indian Reservation.

reality. But private capital must undertake this venture.

The government would sell the timber but would not build the railroad or engage in lumbering or manufactur-

ing. In the old days, this timber or a part of it would have been secured through the operation of the land laws, probably by speculators, who would have sold it to a lumber company with sufficient capital to both hold and develop it.

planer, the dry kiln, sheds, commissary and town. The plant will be set on the brink of the Mogollon rim, looking down into the valley of the White River, with the roofs of the Fort Apache Military Post glistening forty miles away, and over an unbroken stretch of densely forested rugged mountain slopes, with distant peaks silhouetted on the skyline 100 miles or more in an air line. A mountain meadow or, in Spanish, cienega, was chosen as the site on account of the abundant flow of pure water from several huge springs, which will supply the town and provide an ample mill pond and water for the boilers and engines in excess of all possible demand—an important consideration in Arizona. A remarkable feature of this timber sale is that the mountain scenery of this region lies south of the rim, while the timber to be cut lies entirely north and back of the rim. The new town will have all the advantages of a tourist center, with excellent trout streams lying in the valleys to the south, and an unobstructed view of forests which the ax has never touched, yet one has but to turn around, and he will find himself in the midst of one of the largest of modern milling enterprises, conducted on the sound basis of utilizing the mature and over ripe timber without destroying the forest.

For these forests of western yellow pine present a vivid picture of the wastefulness of nature. Over millions of acres they now stand interspersed with the bleaching skeletons of dead trees. Trees must die in the course of time, that other trees may take their places. These pines live to be from two to four hundred years old, but sooner or later they fall, one by one, to the ravages of insects, the force of the winds, or the shattering stroke of lightning. Soon a dense growth of young pine seedlings appear under the snaky outstretched limbs

of the dead ancestor, and in time a grove of young, thrifty black jack pine is formed, so called because of the blackish color of the bark, which as the



CLIFF CIENAGA, ON THE WHITE MOUNTAIN APACHE INDIAN RESERVATION

This is now an unbroken wilderness, but the new town and mill-site will occupy the tract in the background now covered with dense stands of yellow pine. Just beyond lies the Mogollon River, a vertical drop of hundreds of feet, overlooking White River Valley.

tree grows older takes on the characteristic yellow of the species. This grove will slowly thin out by suppression and survival of the fittest until again we have a few



AN APPARENTLY SUCCESSFUL BRAND OF ITINERANT DOMESTICITY

These two forest rangers, shown with their families, are in charge of one of the largest timber sales on the Coconino National Forest, Arizona. Each is provided with a double standard moveable cabin, which can be picked up and transported on log cars whenever the camp is moved in the course of logging.

old veteran yellow pines awaiting their final fate.

The modern regulated logging operation on this area, instead of slashing everything right and left, using up

the small, thrifty poles for ties and mine props, and then accidentally burning the slash and converting the former forest into an addition to the great Arizona desert, will cut only the mature yellow pine with a few of the



GROUP OF YOUNG PINES WHICH SPRUNG UP UNDER THE PARTIAL SHADE OF A DYING VETERAN

This illustrates the natural sequence of age classes in the virgin forest. Groups of various ages are shown in the background. Coconino National Forest.

younger black jacks, where they are too crowded. The trees will be felled away from young timber, the tops lopped, piled and burned at a safe period. The young trees, released, will spring into rapid growth, while abundant seeding will take place from the trees left standing, and the openings will soon be filled with a fine crop of seedlings.

It will take twenty years to cut the timber on this sale area. There is at least four times as much timber on the remainder of the Sitgreaves Forest, not reached by this sale, which will be held in reserve, and will furnish an equal annual cut for the next hundred years. By that time the black jacks left in the first sale will be ready to cut, and the yield of timber from this forest will thus be made perpetual.

This timber sale means, first, prosperity and railroad transportation for an otherwise hopelessly isolated dis-

trict; second, a great increase in the supply of our timber products, estimated to amount to over thirty million feet per year; which would, if left in its natural state, continue to rot and disappear as it has for countless ages past; third, the opening up to the tourist and man of moderate means of a beautiful mountain region with a cool summer climate, real scenery, and room enough to accommodate all comers. No better illustration could be shown of the ideals of public administration towards which the pioneers of the Forest Service were constantly striving and which now, throughout the length and breadth of the west are rapidly bearing fruit.

WAR ON GUNNERS

BY ALFRED GASKILL, STATE FORESTER

IN the fall of 1916 the Forest Fire Service of New Jersey apprehended 136 deer hunters who had made fires in the woods in violation of the law. This year after giving wide publicity to its intention, the Fire Service detailed a number of wardens to patrol the forest sections to which deer hunters resort on the nights preceding the four Wednesdays on which the pursuit of deer is legal. Though the weather was cold and wet only two illegal fires were found. More hunters than usual were out, but most of them arrived on the ground by automobile at about daybreak. Those who came earlier brought oil stoves or fire buckets.

When the small game season opened parts of the state were very dry; these gunners scatter so widely that an effective patrol is impossible and an unusual number of fires occurred. Though it is not the practice of small game hunters to build camp fires they do smoke and through their carelessness in this way, and sometimes by the use of fire to uncover the game, the woods and fields are burned.

The Department of Conservation and Development of New Jersey, following its predecessor the Forest Commission, has declared its belief that there is not room in the state for forestry, for intensive farming, and for free hunting, and has renewed the recommendation made three years ago that all protection be removed from deer and rabbits as the animals which attract most gunners from the cities. The department's position has been greatly strengthened by many complaints from farmers that their crops have been injured or destroyed by these animals. As one sufferer put it, "We feed the things all the year, but dare not shoot them except in the open season, and then have no more rights in our own woods and fields than the sports who come from the cities and overrun us."

The ground taken is radical but is fully justified as a measure of conservation and of justice to the land owners.

IN ANCIENT times Greece possessed about seven and a half million of acres of dense forest, and she was comparatively rich in timber until about fifty years ago. Much of it has, however, now disappeared.—Public Ledger.

STUDIES OF LEAF AND TREE (PART I)

BY DR. R. W. SHUFELDT, C. M. Z. S.

TO ALL who have interested themselves in the study of trees, it is a well known fact that they offer many different angles from which they may be considered. Take the trees of any region—those found in the eastern United States for example; they are first studied with the view of distinguishing one species from another, and also with the view of discovering whether there be any hybrids among them. There are many parts of trees available for the purpose of species discrimination, and they should all be studiously examined and compared; for it is only through thorough and intelligent comparison of parts that we are led with certainty to correct identification of known types. In the first place, we may study the form or contour of a tree as it appears to us in full foliage, as well as in winter when all of its leaves have fallen. This does not apply to such trees as the conifers and others that retain their foliage the entire year around, and only change their outlines and general appearance through age.

Leaves furnish an enormous assistance in identifying a species of tree, and in many instances the leaf alone is sufficient for such a purpose. The flowers and fruit of a tree stand in the same category with the leaves; perhaps next to these three characters we may place that of the bark, while the roots, when they are accessible, the buds and leaf-scars and the plan of their arrangements, are all of the greatest value.

When we come to know the various kinds of trees apart, there next arises the question of their taxonomy or classification; and for those species found in the region above named, this is a problem which, through the labors of students of the subject—of the present as well as of the past—have very largely been settled. So that now, when a new species of tree is discovered, it is more

or less readily described, and assigned at once, as a new species, to its proper genus and family.

The vernacular names of trees and their origin forms another interesting chapter in tree study.

Still another important department of this science is the matter of the regional distribution of trees, or where the various species normally occur in nature. Then we have the changes in trees due to their domestication, crossing and grafting, and other changes due to passing from one environment into another and entirely different one. Such shiftings sometimes produce the most radical and remarkable alteration in many species of trees—should they survive the change.

In tree study, forestry—in all of its branches and as practiced by various nations—is an enormous and extremely important subject. Indeed, it is much too large to be entered upon at this time, more than to mention its importance as a department of tree study. It is international in its scope, and, with some nations, it has been dealt with as a science for centuries.

Julia Ellen Rogers, who has given us a wonderfully useful book on Trees, says that "Forestry is one grand division of the great art of Agriculture, 'the cul-

tivation of the field.' *Silviculture* and *forestry* are used as synonyms. *Arboriculture* includes besides forest trees those that are grown for their fruit, and for ornament. Hence it includes a large part of horticulture and landscape gardening—the growing of trees for any purpose. *Silviculture* is, properly speaking, that branch of forestry which deals with the scientific production of a crop of trees. *Forest regulation* is the business branch, which manages the animal outlay and returns of the forest. It has the lumbering and marketing of the crop in charge. *Dendrology* is one of the fundamen-



EXAMPLES OF GIANT SYCAMORE TREES (*Platanus occidentalis*).

Fig. 16—Group in Maryland on the banks of the Potomac River, at Great Falls, above Washington. This will offer a familiar scene to hundreds of people whose rambles have led them beneath these ponderous Buttonballs.



HERE WE HAVE THE CHARACTERISTIC CONE AND FOLIAGE OF THE JERSEY OR SCRUB PINE (*Pinus virginiana*).

Fig. 1.—Note that its needle-like leaves are arranged in pairs, and that the dark scales of the cone are armed at their tips with a sharp prickly, turned backwards.

tal sciences upon which forestry rests. It is the botany of trees, and has three distinct branches of equal importance to the forester: (1) *Tree physiology and pathology*, life processes of trees in health and disease; (2) *tree anatomy and histology*, the structure, gross and minute, of trees; (3) *systematic botany*, a study of the kinds of trees in order to know them by name."

This latter branch has already been mentioned; and to what this author points out for us, it may be added that the *economic* study of trees is another extensive department for consideration, as the relative value and uses of the various kinds of woods furnished by trees; the economic value and uses of their bark, sap, seeds, leaves, fruit, special parts, roots, and the like. A full consideration of all of these departments would carry us far into the uses of all these materials in the arts, in science, in medicine and surgery, and no end of other activities in which men engage.

We also have the *historical* study of trees—in fact as well as in fable.

As a matter of fact, enough has already been touched upon in the foregoing paragraphs to make clear what a tremendous and vital part trees play, and have played, in the history and welfare of man upon earth. It is no wonder then that such wide and far-reaching study has been bestowed upon them—and that since the very dawn of history.

When one comes to make a very serious study of our trees not only should a small library on the subject be invested in but the parts of trees should be collected and preserved, with the view of forming a study-collec-

tion for reference and for the demonstration to others of ascertained facts in the science. Best suited for this purpose are the buds and leaves of trees; their seeds or fruit, and in the case of some species their preserved flowers. To this end one should have the appliances for the preservation of leaves and flowers; a first-class high-power microscope and its accessories; a suitable camera and complete photographic outfit; if an artist, an artist's outfit in addition. There is quite a long list of other requirements, as the apparatus for making black leaf impressions; what is required for the skeletonizing of leaves; and, finally, a number of field tools, as tree-climbers, saw, carry-case, and the like. Specimens of the photography of leaves will be shown in Parts II. and III. of the present series together with correct methods along that line.

What will be taken up especially in this place will be the collecting, preparation and permanent preservation of leaves. This is a most important and interesting occupation and not at all difficult as to cultivation and accomplish-

ment. One needs a good letter-press such as was formerly used for copying letters; a supply of sheets of soft white blotting-paper (many students use simply newspapers for pressing); folios for permanent preservation and the formation of the leaf-herbarium, and, finally, such small though very necessary accessories as paste, scissors, fastening slips, varnish, and so on. As to varnishing pressed leaves, there are many opinions held; on the whole it seems far better to get along entirely without resorting to it.

Leaves gathered and preserved for study should be collected at all times



THIS IS THE JERSEY PINE IN FLOWER AND SHOWS THE YOUNG AND PERSISTENT OLD CONES ON THE SAME TREE.

Fig. 2.—Jersey pines are quite abundant in southern Maryland and throughout the District of Columbia, where this specimen was obtained.



TWIGS OF THE COMMON RED CEDAR (*Juniperus virginiana*). WITH PERSISTENT LEAF TWIGS OF THE YOUNG TREE.

Fig. 3.—Another name for this tree is the Red Juniper; it often grows along old stone fences and tumble-down rail fences that surround the fields of antiquated farms.

of the year—gathered *thoughtfully* and *understandingly*; they should exhibit, in the case of any species, not only the typical form of the matured leaf, but its variations, its young and old stages, its coloration and changes in the autumn, the dead leaf in winter, its hybrids, and finally some of its most striking anomalies.

In the pressing of leaves the main thing to be attended to is to see well to it that they are, in any particular case, properly spread out between the sheets of whatever paper is used before putting them into the press. Thin and delicate leaves press very quickly—others take much longer; but under no circumstances should they be removed from the press before they are perfectly dry. Highly colored autumn leaves will sometimes stand a very thin application of the best varnish, which brings out their color beautifully. This should dry out thoroughly before the specimen is consigned to its proper folio.

These folios should all be of the same size, in that they may accommodate as big leaves as are to be ordinarily found—some of the magnolias for example. Some leaves are so large, that the only way to include them is by making suitable photographs and inserting prints of them in their proper places. The camera will help out in illustrating a great many other points in leaf-study and collecting. White paper, such as is used by botanists, is employed for the pages of the folios; and in the various volumes the leaves should be preserved along classified lines, arranged according to some well devised system. Neatly written, or on



YOUNG OF THE RED CEDAR (*J. virginiana*) BEFORE ANY CHANGE IN THE FOLIAGE HAS TAKEN PLACE.

Fig. 4—It is interesting to compare this specimen with the much older tree shown in Fig. 3.



HERE WE HAVE SOME MAGNIFICENT SPECIMENS OF THE ACORNS OF THE CHESTNUT OAK TREE.

Fig. 9—Both Chestnuts and Oaks belong in the same family—the Beech family (*Fagaceae*). One of our grandest oaks is the Chestnut Oak (*Quercus prinus*); its leaves to some extent resemble those of the Chestnut tree.



TERMINAL PARTS OF TWO LIMBS OF THE SWEET GUM TREE (*Liquidambar styraciflua* Linn.) IN THE SPRING TIME.

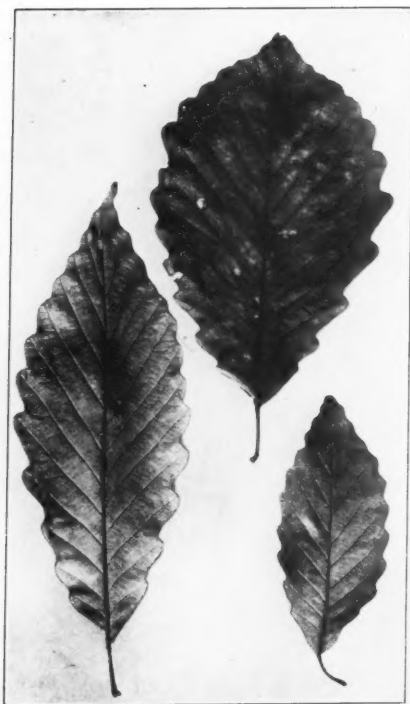
Fig. 6—This is one of America's grandest trees, long known in song and story. Sometimes we hear it spoken of as the "Star-leaved Gum" on account of the regular pattern of its leaves.

a printed slip we should invariably find in the lower right hand corner of the page carrying the leaf or leaves, a succinct account of the specimen: scientific and vernacular name of the tree; locality; date of collection; collector, etc. In a notebook full particulars should be written out of each specimen and what it shows; index pagination can be employed to make ready reference to this.

If convenient the student will be well repaid should he or she visit a first-class herbarium and get the botanist in charge to supplement some of the above instructions.

It goes without the saying that the foliage of some trees will be very difficult to tastefully preserve for reference—as many of the conifers for example, and other big and coarse growths. Speaking of the *Conifers*, reference is made to that well-known group of trees that include all the true cone-bearing species. A "cone" of any of these is so well known an object to most people that it hardly needs any description. In Fig. 1 we see a typical cone of the Jersey or Scrub pine; its overlapping scales are thick, and a backward-turned prickle is to be found at the tip of each of them. All the scales are attached to a central stem, and to each is attached the naked ovule. The ovules nearest the middle of the cone run the best chance of maturity and forming the best seeds. This is particularly the case in those softer-leaved cones of other conifers, where the scales close up more or less at the ends. This either hopelessly stunts the seeds, or kills them outright.

We have a very large number of coniferous trees in this country, and they are grouped as the *Pinaceae*; while the Yews, which markedly differ from them, constitute the *Taxaceae*, there being but one species of the latter,



THREE LEAVES OF THE CHESTNUT OAK SHOWING THE VARIATIONS IN FORM, SIZE, AND CONTOUR; SPECIMENS FROM THE DISTRICT OF COLUMBIA.

Fig. 10—It is not only interesting but of the greatest importance to compare leaves coming from the same tree—that is, with respect to form, size and venation.

which is the American Yew or Hemlock (*T. canadensis*). On the other hand, the Pine family includes the Pines (*Pinus*), the Larches (*Larix*), the Spruces (*Picea*), the Fir (*Abies*), the Hemlocks (*Tsuga*), two genera of Cypresses (*Taxodium* and *Chamaecyparis*), the Arbor Vitae (*Thuja*), and the Juniper (*Juniperus*). In the lists of other dendrologists, we will find the Douglas Spruce in a separate genus (*Pseudotsuga*); the enormous Redwoods of California in the genus *Sequoia*; the Incense Cedar (*Libocedrus*), and another genus of Cypresses added (*Crepressus*). There are more or fewer species in all of these genera, and it must be obviously out of the question even to enumerate them in a brief article like the present one. For example, there are at least a dozen species of Pines; five different kinds of Junipers; nearly as many Spruces, and so on—this enumeration being for the northeastern section of the United States alone; whereas, if we take the whole country, the list is far more extensive. There are no fewer than twenty-one species of Pines in the United States, and so on for the rest enumerated above. A list of all the Pines known runs over six hundred species; so we see that the coniferous group is a very large one indeed, and a very important one, in so far as man's interests are concerned.

It may be said in general of these evergreen and cone-bearing pines, that they are of several more or less distinct kinds, as the hard and soft pines, the yellow pine and pitch pine, the Georgia and Jack pines. Each of these

offer different and very valuable products for the use of man, or at least such as man has made use of in his industries.

A pine tree can easily be distinguished from any other representative of the *Coniferae* by the needle-like leaves appearing in clusters of from one to five needles. There are two in the case of the White Pine (*Pinus strobus*). At their base, these needle-like leaves are enclosed in a sort of papery sheath. These are shed in the "soft pines" as soon as their leaves are developed, while in the pitch pine the leaves and their sheaths are shed simultaneously.

The Jersey Pine (Figs. 1 and 2) is so named for the reason that it is very abundant on the barren and good-for-nothing soil of New Jersey—that is, "the barrens." It is a sorry-looking old tree in this area, doing its best to make the region appear more attractive than it has any claim to. In the middle West, however, this same species may attain to a height of an hundred feet or more, and will move any tree lover to admiration.

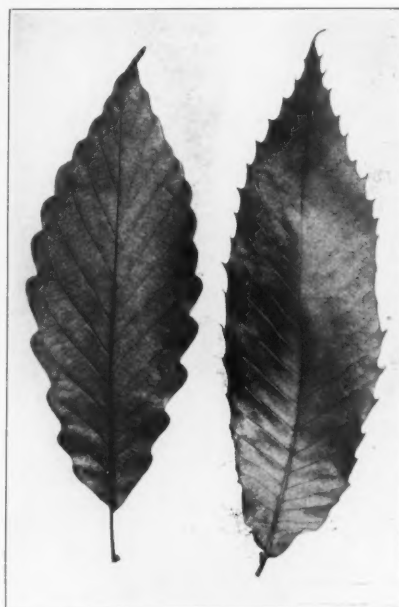
In some localities they make tar from this Jersey scrub pine; and its wood is of some little value, even if used for no other purpose beyond the making of fences or burning it for fuel.

As already pointed out, the Junipers differ from all the other *Coniferae* in not being cone-bearers. There are between 30 and 40 species of them found in all countries north of the Equator. A very good example of the group is our common Red Juniper or Red Cedar (Figs. 3 and 4). It is a most valuable tree in all particulars, as its wood is extremely useful in the trades and arts; it will



THE CHINQUAPIN (*Castanea pumila*) IS THE ONLY OTHER REPRESENTATIVE OF THE GENUS TO WHICH IT AND THE CHESTNUT BELONG (*C. dentata*).

Fig. 12—It is a shrub, and reminds one very much of a miniature chestnut tree, when met with in the dry woods and thickets where it grows.



TWO LEAVES SHOWING THE DIFFERENCE BETWEEN THOSE OF THE CHESTNUT (*Castanea dentata*) AND THE CHESTNUT OAK (*Quercus dentata*).

Fig. 11—The Chestnut Oak is on the right hand side of the picture, and seen to be "undulately crenate-toothed," while the Chestnut leaf is "oblong-lanceolate, pointed, serrate, with coarse pointed teeth, acute at base." Chestnut leaves are also green on both sides when mature.

grow almost anywhere, and is employed as an ornamental tree in homes and estates of every class and description. They are also planted for wind-breaks in various places on our coasts. The aromatic sap of this Red Cedar is of a resinous quality and much disliked by moths. Evergreen berries are greedily eaten by many species of birds, the cedar bird having derived its vernacular name from being conspicuous in that regard.

The full history of our various species of Juniper trees and their introduced relatives, many of which belong in the same genus, would furnish ample material for a good-sized volume.

From the very extensive conifer group we may pass to a small family in which occur but very few genera and species. Upon casual examination they appear to be hardly at all related while botanical taxonomers find no difficulty in demonstrating to us that they are. The group referred to is the Witch-hazel family, the scientific name for which is the *Hamamelidaceae*. In this we find the common Witch-hazel (*Hamamelis virginiana*), a most interesting shrub, with a folklore altogether too long to make record of at this time. The genus *Fothergilla* (*F. gardeni*), found in the low grounds of Virginia and Georgia also hold generic place in this group. Finally there is the Sweet Gum tree (*Liquidambar styraciflua*), which, as Doctor Gray informs us, is "a mongrel name from *liquidus*, fluid, and the Arabic *ambar*, amber, in allusion to the fragrant terebinthine juice which exudes from the tree."

The Sweet Gum tree is also called Bilstead, it being for the most part a coastwise species that flourishes best in swampy woods, and having a distribution extending from southern Connecticut throughout the South and westward as far as the Mississippi Valley to Texas. In Fig. 6 we have an excellent representation of the terminal branches of the Sweet Gum, when well started in flower and leaf in the spring. These came from a magnificent tree that grows in a swamp at Hyattsville, Maryland, only a few miles north of Washington, D. C.; other splendid examples grow in the same locality. The

foliage of the Sweet Gum turns to a superb crimson in the fall, and the tree is readily recognized at a distance. Its wood has a fine grain; the bark is of a dark gray color, and we all know of the corky ridges that grow in broken rows down the branchlets. Its curious catkins, both normal and abnormal, are well shown in Fig. 6 of the present article. Sweet Gums in the South grow to be of immense size, and often attain a height of 150 feet or more. Through all that region it is linked with song and story, for much of which the slaves of prebellum days are responsible; in this too the 'coon and the 'possum cut no insignificant figure.

There is something approaching similarity between the seedballs of the gum and those of the sycamore; though as a matter of fact they are really very different beyond the fact that both hang on their respective trees all winter, swinging from the lower ends of their peduncles.

Julia Rogers very truly says "The sap of the sweet gum is resinous and fragrant. It is easy to find this out by crushing a leaf or bruising a twig. Chip through the bark of a tree and an aromatic gum accumulates in the wound. In the Northern States this exudation is scant, but it becomes more and more plentiful as one proceeds South. The most copious flow is from trees in Central America. This gum is known to commerce as 'copalmbalm,' large quantities of which are shipped to Europe from New Orleans and from Mexican ports each year. A Spanish explorer

in Mexico described in 1651 'large trees that exude a gum like liquid amber.' This was the beginning of the trade."

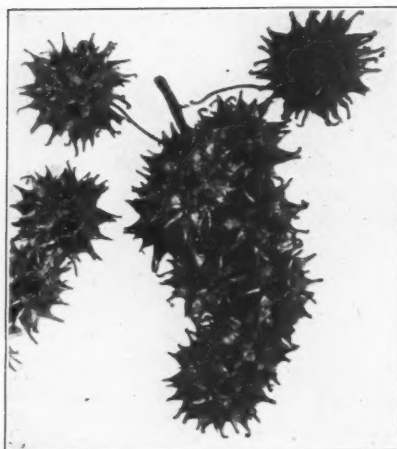
The wood of the Sweet Gum has many uses; it is also a valuable and highly ornamental shade tree.

Another very important group of trees, and one far removed from the Witch-hazel family, is the *Fagaceae*—the Beech family. Here we see associated some of the best known and most valuable trees in the United States. It derives its name from one of the included genera—from the Beech, which is *Fagus*. Besides the two spe-



RED CEDARS AS THEY FLOURISH IN NATURE

Fig. 5—The Red Cedar is often scattered over old farms and unused lands in many parts of the country. In such situations they frequently come to be of great age and size, and lend a peculiar interest to the landscape.



SEED BALLS OF THE SWEET GUM TREE (*Liquidambar styraciflua*).

Fig. 7—The usual single ball is seen in the upper left hand corner; the other two bunches represent rather a rare condition when from two to eight balls fuse together into one mass.

cies of these trees, there are the Chestnuts (*Castanea*) and the Oaks (*Quercus*), of which latter there are a great many kinds.

Oaks and Beeches will be referred to again further along in the present series of articles; while here a few paragraphs may well be devoted to our country-wide favorite, the Chestnut tree (*C. dentata*), and its dwarf and near relative in the same genus, the Chinquapin (*C. pumila*). In Europe and Japan they have other kinds of chestnuts from ours; but the nuts in some instances are not so good, though the sweet chestnut of Spain and Italy (*C. sativa*) is very good and wholesome. The Japanese species has been introduced into some parts of this country. Our well known tree flourishes from southern Maine to Ontario, westward and southward to the Gulf. Miss Rogers erroneously claims that it is not found south of Delaware; but the tree occurs abundantly in Maryland and the District of Columbia.

It is a splendid tree in all particulars, and justly commands the love and admiration of thousands of people in this country who are familiar with it. As stated above, Miss Rogers may have been guilty of a little slip when she gave us the distribution of this tree, but not when she says in the next paragraph: "The elegance of chestnut foliage must strike the most casual observer. Each leaf is so long and tapering, so regularly veined and toothed, so polish-

ed, and finally so admirably set among others as to make it a beautiful and useful part of the great green dome that hides the limbs in summer time." This is a perfect description of the foliage.

All who live in the country where chestnut trees grow are familiar with their blossoms—those dainty, whitish catkins, often six inches long in charming clusters.

Chestnut trees often attain a great age and a correspondingly enormous size. The old Mount Aetna giant is over two thousand years old; its hollow trunk once held an hundred mounted horsemen at one time, it being about sixty feet in diameter—inside measurement. It was destroyed by an eruption of the volcano. A tree of this species near Washington, D. C., has a diameter of ten feet; and, while presenting evidence of decline, it is still in a fair state of preservation, leafing out in great shape every summer. As most of us already know, the wood of the chestnut is of great value, being used for a great many purposes. Then, too, the yield of nuts is sometimes very great and thousands of dollars worth of them are annually sold in the markets throughout this country.

In the Chinquapin (*C. pumila*) we have a veritable dwarf chestnut in nearly all particulars (Fig. 12); in most cases it rarely exceeds the proportions of a shrub, and is, from tips of root to crown, chestnut all over. It grows in pretty much the same places, though it is probably oftener found along the edges of marshes and swamps, ranging from the Middle Atlantic States to the Gulf, and westward to Texas. Chinquapin wood, selected from the largest specimens, is quite as good as that furnished by its giant cousin, and may, with advantage, be used for the same purposes, being particularly useful for railroad ties and fence posts.



TERMINALS OF BRANCHES OF THE BUTTONWOOD OR SYCAMORE TREE (*Platanus occidentalis*) IN THE EARLY SPRING.

Fig. 13—The tender, very pale green leaves of this tree are just unfolding, and many stages of the flower-heads are shown.



A PERFECT LEAF OF THE BUTTONWOOD TREE (*Platanus occidentalis*).

Fig. 14—This shows the under side. Dilated base of petiole also shown.

Speaking of Chestnut trees recalls the fact that among the oaks in this country we have a Chestnut Oak (*Quercus prinus*), which has been so named for the reason that its leaves more or less closely resemble those of the chestnut tree. The leaves of the former, however, vary considerably in size and outline—a fact that will be appreciated by comparing those shown in Fig. 10 of this article. In Fig. 11 we have the leaves of the two trees placed side by side, so that their similarities and differences may be recognized at a glance. We should especially note the fine little prickles along the margins of the chestnut leaf, while the borders of the chestnut oak leaf are in elegant, wavy outline.

The acorns of the chestnut oak are very large, rather sweet, and have a way of sometimes sprouting before

falling to the ground in the autumn. Its wood is tough and hard, as would be expected in so virile and vigorous a tree, while its bark is extremely rough and very dark. With respect to its leaves, they alternate in the matter of arrangement, and specimens have been met with having a length of ten inches. Its deeply furrowed bark is very rich in tannic acid; hence this species is very widely known as the tan-bark oak, and sometimes these tan-bark oaks grow to be at least one hundred feet in height. Taken altogether, then, the chestnut oak is one of our most valuable trees; and to the many uses to which we put its wood and bark must be added the fact that in our parks and on many handsome estates it occurs as one of the most elegant among the ornamental shade trees grown in such places.

In studying our trees, we occasionally meet with a family in which occurs but a single genus, created to contain but a few species. Such is the case with the Sycamores or Buttonwoods, which constitute the Plane Tree family (*Platanaceae*). All these sycamores are confined to the genus *Platanus* and there are usually four species of them recognized, these being the sycamore (*P. occidentalis*), the California sycamore (*P. racemosa*), and the Arizona sycamore (*P. wrightii*), with the Oriental Plane tree (*P. orientalis*). Two other species occur in the Old World, and others may be found in the Southern Hemisphere. Their distribution in present and geologic time is a most interesting subject, but far too extensive a one to go into here.

No tree in nature or elsewhere may be more quickly and with greater certainty identified than a buttonball or sycamore tree; its brittle, light-colored and smooth bark gives the tree away at once. Then, when this bark flakes off—as it is its nature to do—the white layer beneath is exposed, making the trunk appear as though it had been white-washed, with patches of thin, light-colored bark irregularly stuck on. There can be no doubt as to what tree one is considering, as no other tree ever

has this appearance. In addition to these characters we have in summer the big leaves which look like giant maple leaves; and most of the year, especially in winter, we see the seed balls swinging at the ends of their peduncles. These seed balls are almost unique and there can be no such thing as mistaking a sycamore for a sweet gum tree. (Compare Figs. 7 and 15.)

In the American Plane tree (*P. occidentalis*) two seed balls may be found on one peduncle—one below the other; while in other species, as the California sycamore (*P. racemosa*), and doubtless in many others as many as seven of these may be strung in one pendulous line together. (Six are shown in Fig. 15.) They are smaller, and of a beautiful green color in the spring, when

the new leaves appear with them; and they are of many sizes, as will be appreciated by referring to Fig. 13 illustrating the present article. This beautiful and very instructive branch was gathered just beyond the city limits of Washington, D. C., where many of its kind flourish in all of their magnificence. Indeed, some of these trees up the Potomac above the city have grown to become most superb examples of their kind; a group of these are here shown in Fig. 16. Surely the one in the foreground is over 150 feet in height with a diameter of trunk to correspond. Curiously enough, they all lean towards the river, but for what reason it is difficult to say. All about them, in shade and shadow, grow the most lovely flowers we have in the flora of this region. It is a charming locality to ramble through in the summer time,—that is, until an up-the-country rain swells the turbulent old stream some day



FERTILE FLOWER-HEADS OF THE SYCAMORE TREE

Fig. 15—They are usually single, one on the end of each peduncle. Here the latter are single or branched, and as many as six heads attached; there may be more.

so that its roaring, chocolate-colored flood comes plunging down, carrying all before it—among other things inundating both banks often to a depth of ten or twelve feet, or even more, rendering all these beauty-spots veritable muddy marshes with every trace of nature's garden gone.

FOUR tracts of National Forest spruce are being sold by the United States Forest Service in District No. 6. No other species will be used except as needed incidentally in the logging operations. The contract requires lumber to be manufactured in such a manner as to produce the maximum amount of airplane material. In order to make it possible to get out the spruce quickly, the Forest Service has sacrificed some of the usual requirements. Only those trees containing airplane stock will be cut.

TIMBER 4000 years old, probably the oldest timber in the world which has been subjected to the use of man, is found in the ancient temple of Egypt, in connection with stonework which is known to be at least 4000 years old. This was the only wood used in the construction of the temple, and is in the form of ties, holding the end of one stone to another. When two blocks were laid in place an excavation about an inch deep was made in each block in which one of these wooden ties shaped like an hour-glass was driven.—Boston Traveller.

Forestry for Boys and Girls

by Bristow Adams

PAYING FOR PINE TREES



THE letter said all there was to say. It covered the case fully, and no one could mistake what it meant. It was cold in tone and very much to the point, running about as follows:

"Dear Sir:

"Your two sons, with Johnny Roe and Dick Doe, have destroyed 47 pine trees on my grounds. These trees had been in place for three years, and I shall expect you and the parents of the other boys to pay the cost of replanting others of the same age and size. There is no doubt of the fact that these boys did the damage, for they were caught in the act. If you have any doubt as to the amount of the damage done, you may come and see for yourself. I shall replace the trees in the spring and shall send the bill to you."

The name signed to the letter was that of one of the richest men in all our neighborhood, who has a great big house and grounds, with everything planned and laid out by the man who won the prize for the best plan for the new capital of Australia.

There was nothing for me to do but to write back to him and tell him that I would make good the damage done by my two boys. I knew the plantation, and I knew the man. It would do no good to tell him that the pine thicket was too closely planted, and that the trees would crowd each other out in a year or so; then he would have to cut them out himself if he did not want them to kill one another off. Besides, he had the right to require any settlement that seemed good to him, and I had no right to question it.

THE letter was the first news that I had of the injury to the trees. When I asked the boys about it they told a straight tale. Toto had suggested the idea of making an Indian hut; the pine branches were there in a thick growth. In almost less time than it takes to tell about it, the frame-work of the hut was up and was snugly covered with woven pine boughs. It was a good job. I saw it at the same time that I saw the trees with the center shoots broken off and some of the side branches stripped. As the letter said, there was no doubt as to the damage.

WHAT surprised me most was that the boys had done such a trick. I had thought that they had been taught not to hurt other folks' things, and that, most of all, they had learned never to cut or mar a tree. But with all the boy-scout wood-craft that is printed in books; and all the Indian trail blazes that are given for boys to make, I am surprised that no more harm is done. I think that my boys have learned a lesson from this; I hope they have, anyhow. Their Christmas was cut down; they have to stay within bounds; they must earn at least a part of the money that the trees will cost.

It may be true that they did not know how much harm they were doing. They said they did not know that the trees were planted, and thought that they "just grew." When I went back in my mind to the same sort of thing that grown men have been doing with the forests of the country,—slashing and burning with no thought of the time it took the trees to grow, and of the cost that it would take to replace them—I confess that I could not be as harsh as I might have been.



NOW the boys see that each tree tells its own story as it grows. They have been shown that the breaking off of the top will make a crooked trunk, no matter how hard the tree tries to grow straight again, and that every wound the little sapling gets is written some way in the history of the grown tree, no matter how big it may get to be. The scarred old pine on the mountain top is bent by the gales and snows just as an old man is bent by the hard work that he has had to do all his life. The limbs on the side toward the cold, harsh winds are short and twisted; those on the sheltered side can grow to be longer and straighter. The scars made by the ax on an old trunk may be entirely grown over, with scarce an outward sign that there is a tell-tale mark on the wood inside. But when that tree is cut into boards, the very ax marks put there a hundred years before will show plainly, and may make the board that is cut from that place in the trunk unfit for use in a fine floor. This, too, is the very least of the trouble, even when the cut is healed over with a clean scar. But if the germ of a tree disease gets into the wound while it is open, decay may spread and the whole trunk may become rotten and hollow even though it may appear sound on the outside.

Each tree then, keeps its own diary, and it writes in it every day the record of the season, whether it be moist and mild with an annual layer of good growth, or whether it be dry and trying, so that the plant can store up very little food. The lean years are all set down just as they come, and the year of the big freeze may leave a frost-crack that never heals.

Before the whites came here, two little Indian boys were shooting at an eagle's feather stuck in the rough bark of a great hemlock and made dents that were never wholly lost. One of the flints broke off, perhaps about the time that Columbus discovered America, and a steel band-saw lost three teeth when it struck that piece of arrowhead in the saw-mill some 415 years later.

IF the little pines, which were marred by the present-day boys, should have been left, no matter how old they might grow, they would still show a crook in the grain where the top had been broken out and a side branch had tried to straighten up to take the place of the lost leader. The broken-off side branches would leave little knots, if they did no worse in giving a chance for insects or diseases to make a greater injury.

These are some of the lessons that the boys learned from the building of their Indian hut. They are not the most important ones, however. What I hope they have learned is that they must never touch the property of other people, that they must respect the rights of others, that they must work no injury to tree or branch wherever it may be found, except as they have a right that comes from their own ownership,—and that even then they will give full thought as to how much the cutting of their own trees may act on the good or ill of all of the rest of the people.

IN the meantime, they have mortgaged their own future to the extent of at least one Liberty Bond, and have given the Old Man the thrill of knowing how much it costs to pay for the work of a high-priced landscape architect.



CONTROLLING SNOW BY TREE PLANTING

BY W. C. PALMER

FARMERS have for many years controlled snow about their farmsteads by tree planting and the railroads are now trying the same scheme in protecting their right of way. The common board panels that have been so commonly used are expensive, and in the winter with the big snow they often prove more of a detriment than a help. The trees can be planted so as to be effective under the most severe conditions and after they are planted and given a good start the cost of upkeep is slight.

The Minneapolis, St. Paul and Sault Ste. Marie (better known as the Soo) Railway has gone into the tree planting with a vim. Beginning in 1914, they have



THE SERVICE OF THE TREES

Showing how the snow is held by trees, and a convincing argument in favor of planting along railroads for this purpose.

already planted trees along 250 miles of their right of way and they have 70 miles more ready to plant in the spring of 1918. Their plan is to prepare and plant 100 miles of right of way each year. So far the tree planting on the Soo Railway has been in North Dakota, but next year some tree planting will be done to protect the right of way in Wisconsin.

The tree planting is under the supervision of T. A. Hoverstad, Agricultural Commissioner for the Soo road, but formerly superintendent of Farmers Institutes in North Dakota, where he lectured to the farmers on how to protect their homes from snow and wind by tree planting. In the early nineties Mr. Hoverstad planted two experimental forest plantations in western Minnesota for the University of Minnesota, the earliest work

of this kind done in this section. His long experience in forestry work has been a good preparation for the work on the railroad.

In this work the first problem that came up was getting the trees planted. One man can set about a hundred trees a day by hand, and at that the trees were not always set in the best way. Mr. Hoverstad solved this problem by inventing a tree planter. With this three men can average 8,000 trees a day with a gasoline consumption of 8 to 10 gallons for the tractor. This is as many trees as 80 men could set in a day by hand. This was not the only advantage as the machine could be set to go at a certain depth and all the trees would be planted this depth. And again with the tree planter, moist soil is packed about the tree roots, while in hand planting if the soil is dry on top this dry soil will run into the hole and cover the roots.

The tree planter is made up of a subsoil plow with two upright mold boards fastened vertically and placed six inches apart. This serves as the furrow opener. It can be set to go as deep as 12 inches. The furrow opener is followed by two discs that throw the soil in and these are again followed by two press wheels that pack the soil about the tree roots. In this way the furrow is closed as soon as the tree is set into it and there is no way for the soil to dry or for dry soil to cover the tree roots. Seats



MUCH DEPENDS ON ITS PROPER PROTECTION

A railway cut. These must be kept from drifting full of snow, and proper tree planting has proven most effective in accomplishing this result.

are provided for two men, one on each side of the furrow opener, so that they may conveniently drop the trees into the furrow. A larger percentage of the machine-planted trees live than of those planted by hand.

The next problem was what kind of trees to plant. In this connection one must remember that these trees are to be planted to protect railroad cuts, which means that they will be planted on hills and knolls and that these are often gravelly and usually covered with a thin soil. Willows will grow under these conditions and their nature of growth is such that they check the wind and

so stop the snow. Several kinds were tried out. The laurel leaved willow has proved the hardiest and is the one that will be used most extensively in North Dakota. The willows are planted in the outer row and also in some of the rows nearest the track. The buffalo berry, carragana, buckthorn and artemesia are also used in the outside row, the aim being to have a low growing spreading tree or shrub in the outside row, one that is quite dense near the ground so that there will be no big openings for the wind to shoot through. The artemesia dies down each year but the stems hold many of the leaves and remain upright during the winter so that they make quite an effective barrier to the wind even the first year. The artemesia will grow under very severe conditions. Willows are cut back to cause them to thicken up. When cut back in the spring they send up a great many shoots that grow to a height of four to six feet by fall, making a good protection for the winter. The second row is planted to green ash or cottonwood. The third row is planted to green ash or box elder, and the remaining five rows are planted to willows. These will be cut back periodically one row at a time. Eight rows of trees are planted on the north and west sides of cuts and six rows on the south and east sides. At first but four rows were planted on the north and west sides and three on the south and east sides, but this did not give enough protection, so it was decided to increase the plantings.

The fifty foot right of way on each side of the track was found to be too narrow for effective tree planting, so now 75 feet in addition are being bought on the north and west sides of cuts, and 50 feet additional for the south

done the best, probably explained by the fact that it is on sandy land and under the same climatic conditions as those under which the trees are to grow.

The trees are taken in refrigerator cars to the cuts where they are to be planted. In this way it has been found possible to keep the trees dormant until July. The cars are placed at the nearest railroad station and the trees hauled out to the cuts and heeled in until needed for planting.

This tree planting is encouraging many farmers along the right of way to plant trees. One of the drawbacks in successful tree planting is often that the land is not properly prepared. Any one who observes the way the trees on the right of way are planted can readily learn



CULTIVATE THE TREES

The cultivation is done largely by discs. The orchard disc and the common disc are used alternately so as to keep the ground level. The one throws the soil in and the other throws it out.

how to do it on adjoining farms. There is no patent on the tree planter here described, so anyone may make and use it.

While most of the tree planting has been done in North Dakota, it is also needed on the cleared land in the states originally wooded. Mr. Hoverstad is advocating buying the extra right of way before the land is cleared. It does not cost much then and the trees are already on it. After the land is cleared it becomes much more expensive and difficult to buy and then it must be planted.

While the tree planting has not been carried on long enough to have much data on the cost of it, enough has been done so that a general idea can be formed as to how the cost of protection with board panels compares with the cost of securing protection by tree planting. It takes 640 16-foot panels to protect a mile of right of way with a single snow fence. These cost at least \$2.50 each, or a total of \$1,600. The annual depreciation is 20 per cent, or \$320. The cost of setting up and taking down is about 20 cents each, or \$128. Interest at six per cent is \$96, or a total of \$544 per mile per year. Planting eight rows of trees on one side of the track and six on the other will require 25,000 trees for a mile. At five dollars per thousand this will amount to \$125. The cost of planting will be less than \$50. The trees will occupy 15 acres and if the cost of preparation is \$15 per acre this will amount

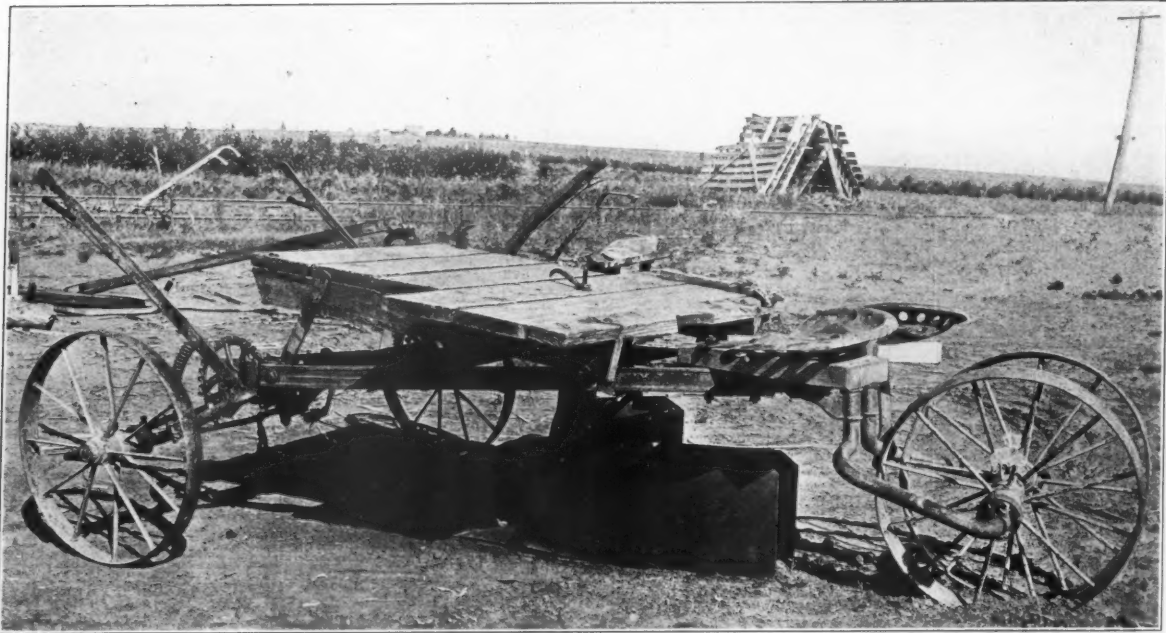


THE PLANTER IN OPERATION

Planting trees with the original tree planter. This was drawn by horses, and was a great improvement over the old method of hand planting. Horse-power has now given way to gasoline.

and east sides. The trees are set three to four feet apart in rows eight feet apart. The land that is in native sod is given two years' preparation and that which has been in cultivation is given one year's preparation before the trees are planted.

A nursery has been started and the trees are being raised for the railway planting. So far most of the trees have had to be bought from nurseries. Many of these old trees have been secured at from \$2.50 to \$6.50 per thousand. The trees from the railroad nursery have



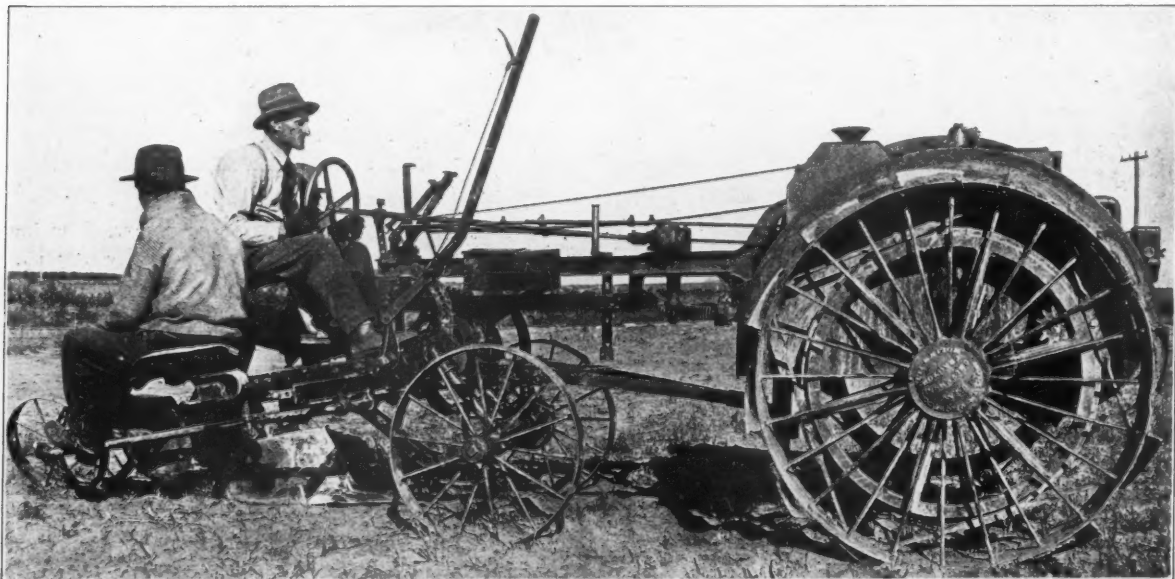
A GREAT LABOR SAVER

Showing detail of original tree planter, which may easily be constructed by anyone, as no patents have been taken on it. This is highly efficient and solves one of the important problems of tree planting on a large scale.

to \$225, or a total of \$400. No charge has been made for interest. There will need to be some replanting and the trees will need to be cultivated three or four years. After that the trees should not need much attention except that the willows will need to be cut back occasionally, and for some time what is cut out will be used for cuttings. It must be remembered also that the panel snow fence is not always effective so that the loss of traffic in case of snow blockade may be more than the cost of the snow fence and with it there also comes the loss of prestige. The trees when three or four years old and

planted properly will thereafter furnish effective protection.

It will be seen that the tree planter has done much toward making the tree planting a success, and such tree planting is proving an effective method of keeping railroad cuts free from snow, even in the winter with the big snows. Without the increased efficiency which these planters make possible tree planting on a large scale would have been so laborious as to be practically prohibitive. By using the tree planters large areas are covered in short time.



THE IMPROVED LABOR SAVER

The new tree planter, attached to a tractor. Note the furrow opener, the disc for throwing the soil in and the press wheels. It is with this outfit that three men can on an average plant 8,000 trees in an eight-hour day.

SELECTING TREES FOR SHELTER, SHADE AND SHOW

BY HENRY R. FRANCIS

PROFESSOR OF LANDSCAPE EXTENSION, SYRACUSE UNIVERSITY

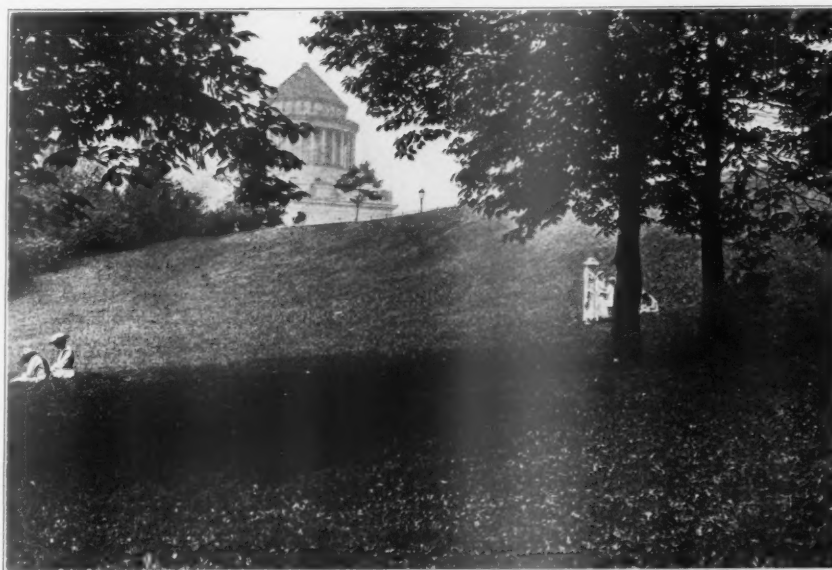
THESE are not the only purposes for which trees may be selected, but shelter, shade and show will almost completely cover the purposes for which most ornamental trees are planted. Usually those trees which are planted for utilitarian purposes—shade and shelter—are much less expensive than those which are planted solely for esthetic purposes. The results that are obtained are ordinarily more satisfactory from the former than from the latter class of trees.

Nearly anyone can determine where shade and shelter are desired, but it takes an artist to select and locate trees for show, particularly when the show desired is one of harmony and restfulness. However, this should not discourage the lover of trees in planting those that are particularly appealing to him. It should be an incentive for studying design in tree arrangement. It should tend also toward the appreciation of the value of the service of some landscape architect.

Trees for shade are frequently planted along city and village streets and along the country roadsides. Where the space permits it is desirable also to plant trees for shade on the lawn. The planting of trees for shade along city streets is limited to a very few varieties. The artificial conditions under which trees are forced to struggle when planted along business streets necessitates the use of even a smaller number of varieties than those available for use along other streets which are developed more for residential purposes.

The most successful selection for business street tree purposes seems to be that of the Sycamore. The American sort, which is known botanically as *Platanus occidentalis*, can be found in many of the older cities in the eastern part of our country along the streets near the centers of the business districts. These are, without doubt, the remnants of the earlier growth of trees which, before the streets were extensively developed, included

many other native species, such as the elm, the maple, the ash and the horse chestnut. Of these trees which have gradually died out, the elm seems to have withstood the increasingly artificial conditions much longer than the others, but the fact that the sycamore may yet be found in business districts is an encouraging indication that it should be more commonly planted in these places. Of course, the sycamore, if allowed to grow without any care or treatment whatever, is liable to become scraggy and altogether too large. In London, where the sycamore is used extensively for street and avenue planting, the trees are given proper attention and are maintained in desirable shapes and sizes. So popular has this tree become in England that it is commonly known there as the London Plane. There is a tendency on the



VISTA OF GRANT'S TOMB, RIVERSIDE PARK, NEW YORK CITY

Trees may be grouped so as to frame an attractive view. This method of tree arrangement is used extensively in park planting. It can be used with equally good results in private estate planting.

part of the city foresters in some of the cities in this country to give preference to the Oriental Plane tree, *Platanus orientalis*, rather than to our own native sycamore. It is true that the oriental variety grows into a more symmetrical tree, but I believe that our own native sycamore is worthy of a more extensive trial for shading business streets. Another tree which, for use along business streets, has gained great popularity, is the Norway maple. Its use, by no means, is confined to these locations. It is being planted in immense numbers in city residential and suburban streets. This maple is probably more desirable for city streets than the other maples. It is covered with foliage early in the season, and is one of the last to drop its leaves in the autumn. It will not grow into as large a tree as the sycamore, although I have seen it along country roadsides where it has attained a comparatively large size. When selected for city streets, it develops into a shapely tree if the lower branches are gradually removed so that when the tree begins to take its ultimate form there are no branches from the main stem lower than twelve feet above the

of a more extensive trial



THE WILLOW IS OFTEN A PICTURESQUE TREE

Here the shade of this willow is acceptable. Ordinarily this variety of tree is found near the edge of water or in other moist locations. Sometimes it is planted in quite dry soils where it adapts itself comfortably.

surface of the ground. In selecting shade trees for residential streets, for parks and for home grounds, careful attention should be given the elms, the lindens, the oaks and the maples. For these places no other tree has the winning characteristics of the American Elm. It grows rapidly and is of long life. It has a graceful and a desirable form. It is quite adaptive to various soil conditions, although it grows most luxuriantly in the moist soils such as are found in meadows and along river banks. There was a time, however, not very long ago, when the planting of this beautiful American tree met with disapproval and was infrequently chosen, but the city forestry departments, where these

have been well organized, have shown that it is not at all difficult to combat with the insect enemies that are liable to prey upon elms when they are given little or no care.

When the American Linden, or basswood, as it is usually called, is in prime condition, it is a tree that commands respect of all who know it. As it grows older it is surpassed in some of its qualities by some of the European Lindens, particularly the Crimean Lindens and the English Limes.

Of all the oaks, that variety which is most frequently selected for shade is the Pin Oak. It seems that the nurserymen can supply this variety much more readily than the other two varieties—the Scarlet Oak and the Red Oak—which are also useful. These three oak varieties are excellent for shade tree purposes and should be more frequently selected by tree planters. Out of the three, the Red Oak is the most rapid in growth. In similar soil conditions the Red Oak will surpass the Sugar Maple in rapidity of growth, and while the Sugar Maple is not considered a slow growing tree nearly everyone thinks of the oaks as being so slow in growth as not to warrant extensive planting.

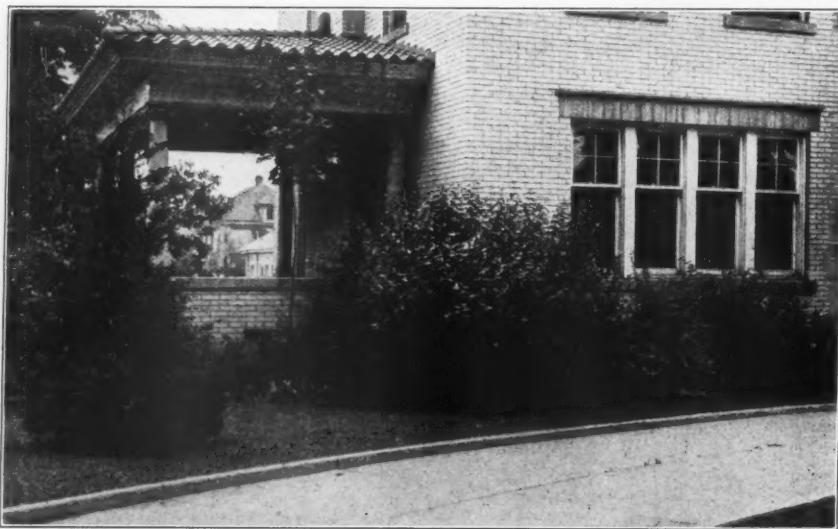
Although shade is properly one

form of shelter which trees afford, we are in the habit of thinking of windbreaks, screen plantings and woodland groves as the typical forms in which trees are planted for shelter purposes. Out in the prairie states where windbreaks are essential to success in farming and are absolutely necessary in securing comfort to man and beast, windbreaks are as much a part of the logically developed home



THE GAUDY BLUE SPRUCE IS A MUCH OVER-USED TREE

Nearly everyone knows the brightly colored Blue Spruces. These trees are most effective when planted with groups of other trees for contrast and background.



A HOUSE FOUNDATION PLANTING COMBINING TREES WITH SHRUBS

To soften the ground line of buildings, masses of shrubbery are extensively planted. To obtain emphasis and contrast at appropriate points, specimen trees may be used. In this picture a Japanese Cypress is shown at the left.

grounds as the water supply. Some times they are immeasurably less troublesome to acquire. In these prairie regions the windbreaks are of a very substantial character, unlike those which are usually found planted in other sections of the country in the form of a single row of

trees. These windbreak plantings are at least one hundred feet in width and composed of several varieties of trees such as Scotch Pine, Black Hills Spruce, Carolina Poplar, Green Ash and Laurel Leaf Willow. In other places where the effect of wind is not so severe as on the prairies, but nevertheless where it is worth reckoning with, sheltering protection may be secured by the use



ROADSIDE PLANTING WITH TREES AND SHRUBS

Masses of shrubs and groups of trees afford protection to the road and enhance the beauty of surrounding scenery to such extent as to make them indispensable.



THE PIN OAK USED AS A LAWN SPECIMEN

If it may be said of any tree that it has a stiff as well as a graceful character, surely this can be said of the Pin Oak. When young the Pin Oak is quite formal in its appearance, but as it grows older the terminal branches become willowy, which give this tree a graceful air.

of White Pine, White Cedars, Norway Pine, Hardy Catalpa, Osage Orange, Honey Locust and Red Oak, in addition to those varieties of trees which are used for the same purpose in the prairie regions. Where the wind is not particularly intense it may be sufficient to plant a single row of trees in hedge fashion, and this will give all

the protection needed from a windbreak.

Where the ground is not so limited as to demand the use of the smallest possible space for the development of a shelter planting, something more than the planting of a single row of trees may be attempted. This is highly desirable if the shelter or screen planting is the background for the lawn or of a fine meadow view, or is the frame for a delightful vista. In these cases the shelter belt of trees may be fashioned after the border of some nearby woodland where the soil conditions and the exposure are somewhat similar to the planting problem in hand. In copying nature's methods in tree arrangement and composition, it is wise procedure to select examples of borders that have developed along uneven and naturalistic lines. In most cases the borders of woodlands commonly found are those that follow straight property lines. These are "man trimmed" borders which have been robbed of the uneven and graceful outlines usually found where growths of the trees have developed along natural and unhampered lines. In these undulating borders we obtain a play of light and shadow which is charming and which is wholly absent in the common hedge-shaped wind-

break. In selecting the trees for this type of planting it is comparatively easy to produce pleasing results by the use of a few varieties of trees. Borders that have resulted from natural conditions contain from three to eight varieties of trees with one or two varieties predominating.

In considering the planting of trees for shelter, wind is not the only factor to be taken into account. Often it is desirable to screen an unsightly object or group of objects, the presence of which may be a blemish in an otherwise beautiful landscape. We can rarely remove these objectionable features from the line of our outlook, but we may screen them by planting a mass of trees and shrubs. Great variety is possible in



THE RED OAK GROWS MOST RAPIDLY OF ALL OAKS

In similar soil conditions the Red Oak will surpass the sugar maple in rapidity of growth and while the Sugar Maple is not considered a slow growing tree nearly everyone thinks of the oaks as being so slow in growth as not to warrant extensive planting.

the effects produced by these screen plantings, but as a general rule best results are obtained by selecting one kind of tree for the bulk of the planting and allowing this to become the dominating feature.

In addition to the sheltering and the screening of any particular kind of grounds as a whole there are special parts that are capable of most satisfactory development when screened from the surroundings. For example, home grounds are conveniently divided into lawns and meadows; garden areas, recreation grounds and play courts, service sections and building areas. The most effective treatment of any, or of all these parts, may be made when each is comfortably sheltered and securely screened from the others.

One of the most popularly deciding factors in selecting trees for planting on home grounds has been their ornamental value. Any nurseryman will admit that his best sellers are the trees that have some striking characteristic. This may be the reason why many front lawns that have been "landscaped" will exhibit in the most strategic location such gaudy and glaring trees as Koster's Blue Spruce and Catalpa Bungii. But skilled plantsmen will inform us that a "showy" tree is not artistically the "whole show" in itself. Each individual tree should bear the proper relation to those that are near it and the entire assortment should be a pleasing composition with no startling and inharmonious effects. This idea of selecting trees for their values in making good compositions will be found to be the principle in all recognized landscape planting. This is the reason why a planting plan is so essential in securing satisfactory results where more than a few ornamental trees are to be planted.

Any home grounds, either in whole or in part, that are large enough to demand the use of a number of

ornamental trees usually will have some special character of its own. To select trees for planting this sort of an area that will emphasize the character of the land is the key to the situation. One would not seriously think of selecting for a hilltop the type of trees naturally found in the low meadows. While this may have been

done thoughtlessly many times, it is no criterion for a planter. Plant such trees as would naturally grow on the particular area. In locating them, use judgment and artistic sense to secure attractive landscape pictures as results. There

are certain ornamental trees that do not "mix well" with other trees. These may be used as specimens and should be planted at some distance from nearby trees where there is sufficient space for individual development. Among these specimen trees there are some that are distinctly formal in outline. Other trees are picturesque in their general expression. Many trees used for specimen purposes are neither decidedly formal or strikingly picturesque, but are easy-flowing in their outlines and are graceful in their expression.

Among the formal trees there are evergreens such as the Austrian Pine and the Red Cedar and deciduous trees such as the Horse-chestnut, the Norway Maple, the English Hawthornes and the Lindens.

For trees possessing a picturesque character there are many of the Oaks, the Birches, the Poplars and nearly all of the Pines. Perhaps the Pine most striking in form is the Pitch Pine, which grows in barren soil such as on Cape Cod and along

the sea coast of New Jersey.

The American Elm is probably the most noticeable example of a tree of the deciduous sort full of grace and easy-flowing lines. The Red Maple is another graceful tree. For a large graceful evergreen, nothing surpasses the Hemlock. Where this would be too large for use



A LAWN BORDER PLANTING FURNISHING A SCREEN

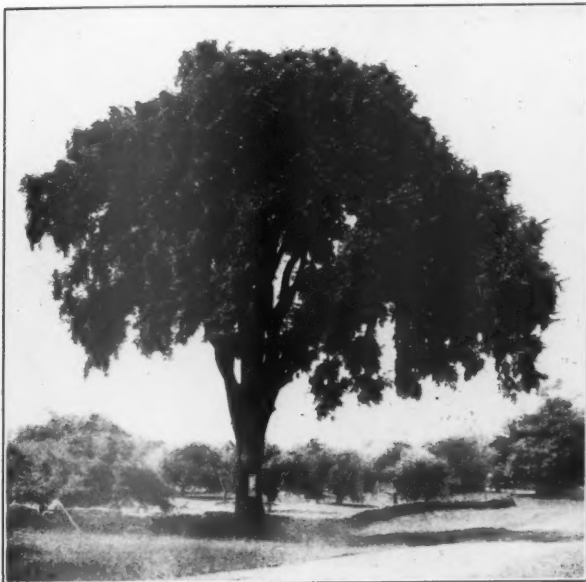
In this border planting both evergreens and deciduous trees have been used. The large tree in the center of the picture is a Pin Oak and the light colored pyramidal tree at the right is the Blue Spruce. In the background may be seen the tops of Norway Spruce.



WHITE PINE ON THE COUNTRY ROADSIDE

For shade and shelter along highways the White Pine is admirably used. It may be used also for windbreaks and other shelter plantings.

the Japanese Cypress offer good material for graceful plantings. Trees for emphasis which are very spectacular in form, color and line may be found among the Spruces; the one most commonly used for this



A STRIKING SPECIMEN OF THE AMERICAN ELM

A rarely beautiful specimen, testifying strikingly to the right of the Elm to first place on the list of ornamental shade trees. The universal grace of its lines in all its forms and its picturesque foliage are noticeable always. The tree here illustrated is an excellent example.

purpose being the Colorado Blue Spruce. The highly colored and otherwise striking tree is many times used where its emphasis is too bold and strong. It needs the association of other evergreens of a less spectacular color. When vertical emphasis is desired it may be secured by the use of the Lombardy Poplar.

There are trees for nearly every place and purpose. In order to realize the utmost benefit from planting the planter must give serious consideration to the selection of his material. A study of soil and exposure will determine in a general way the proper trees to use, but the final choice is a matter of determining the effect desired as an ultimate result of planting trees.

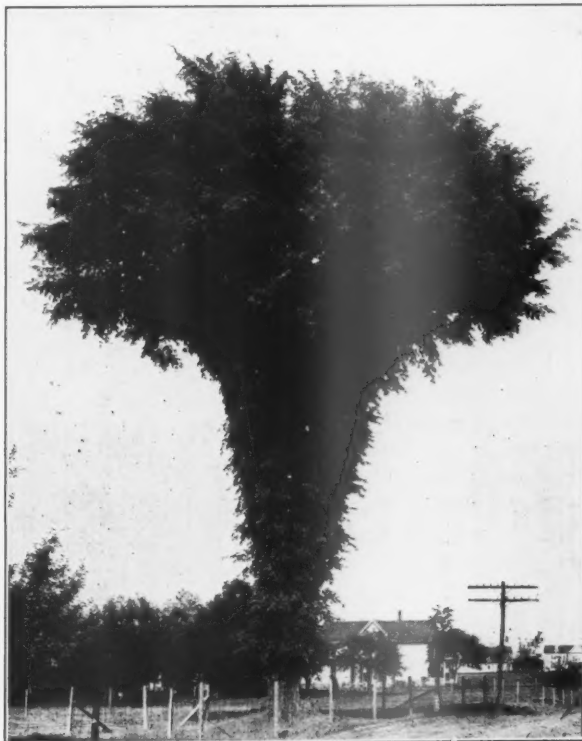
FORESTRY ON INDIAN LANDS

SECRETARY of the Interior Lane, in his annual report for 1917, says of forest conditions on Indian reservations: "The efficient lookout and patrol system now maintained on Indian reservations having large tim-



THE WHITE SPRUCE MAY BE USED FOR EMPHASIS

Although this tree is not as spectacular in appearance as the Blue Spruce it is, nevertheless, a good tree to use as a specimen where emphasis is desired. The picture illustrates this use.



WHAT IS KNOWN AS THE "VASE" TYPE OF ELM

And rightly, too, though it might be called "The Bouquet" with equal fitness. This beautiful effect is brought about by feathering, or the growth of small branches on the trunk almost to the ground, until it resembles closely a giant vase or an old-fashioned bouquet.

ber areas is largely instrumental in preventing heavy annual fire losses. Appraisal of timber resources involving much incidental data has been conducted during the year, and among the large sales of timber made were two on the Klamath Reservation of about 430,000,000 feet at the unit price of \$3.57 per thousand feet, board measure, for yellow pine; two of 60,000,000 feet on the Flathead Reservation at prices from \$3.65 to \$4 per thousand; about 18,000,000 feet of mixed species in northern Michigan besides other smaller sales. At the Menominee Indian mill, where 17,000,000 feet of lumber were manufactured under government management, Indians earned more than \$80,000 in wages during the year.

LOUISIANA'S FORESTRY SUPERINTENDENT

R. D. FORBES has been appointed Superintendent of Forestry of Louisiana by the Department of Conservation.

The duties of the Superintendent of Forestry will be to acquaint himself thoroughly with the forest conditions of the state, and with all concerns in the lumbering busi-



R. D. FORBES

The newly appointed Superintendent of Forestry of the State Department of Conservation of Louisiana.

ness. As soon as the work can be organized, it is intended to establish some form of fire protection in the state, and to bring about co-operation between the Department of Conservation and lumbermen and wood-lot owners, and to encourage reforestation of denuded lands.

Mr. Forbes is a graduate of Williams College, Massachusetts, 1911, and of the Yale Forest School, 1913. He has spent three years in the United States Forest Service in Arizona, New Mexico and North Carolina, and for the past fifteen months has been assistant forester of New Jersey.

J. O. SETH, Assistant to the Solicitor of District No. 3, has resigned from the United States Forest Service to accept appointment as Assistant United States District Attorney at Santa Fe. Mr. Seth has been connected with the District for six years.

PENNSYLVANIA'S FORESTER SOLDIERS

NATURAL pride is taken by the Pennsylvania Department of Forestry in the patriotism of its foresters as shown by enlistment in the army. The claim is made that the Department has a larger proportionate showing than any other branch of the state government. The total number of foresters who have gone into military service is 32, which is 43 per cent of the foresters who were in the employ of the department when war was declared. The operation of the draft will probably take nine or ten more, which will leave the department with less than 40 per cent of its normal field force of foresters. In addition to those enlisted three of the state's foresters are serving as listing officers for the 20th Engineers (Forest) and two ex-foresters are already in France with the 10th Engineers (Forest).

E. A. Ziegler, formerly director of the State Forest Academy, where state foresters are trained, holds a commission as captain in the Coast Artillery and is instructor in military mapping at Fortress Monroe. W. Gardiner Conklin, formerly in charge of reforestation and nursery work, has a commission as first lieutenant with the 20th Engineers (Forest) now in process of formation. J. W. Seltzer, formerly forester in charge of the state forest at Coburn, is a first lieutenant with the 10th Engineers (Forest). E. H. Smith, formerly in charge of the Bald Eagle State forest near Williamsport, is a first lieutenant with the 316th Infantry.

NAVY DEPARTMENT NEEDS GLASSES

MEMBERS of the American Forestry Association are asked to donate to the Navy Department any binoculars, spy glasses, or telescopes they wish to give.

No supply of these glasses can be purchased in the country and although some 3000 were given by citizens in answer to a recent appeal, many thousands more are needed.

Glasses should be securely tagged, giving the name and address of the donor and sent to Hon. Franklin D. Roosevelt, Assistant Secretary of the Navy, care of Naval Observatory, Washington, D. C.

Those accepted will, if possible, be returned after the war.

STRIKING evidence of the lasting qualities of wooden ship comes in the following Associated Press dispatch from Copenhagen: "In the Danish sailing fleet are 16 vessels each more than a hundred years old. The oldest is the Constance, registered at Nalskov, and built at Aroe in 1723. This vessel has seen ten generations of Danish kings, and was already 100 years old when the first steamer was built."

THE Extension Service of the New York State College of Forestry is receiving numerous calls for help in marking trees to be cut for fuel in the New York woodlots. In accordance with its agreement announced early in the fall, men are being sent throughout the state on this work.

THE YEAR WITH THE FOREST SERVICE

RECEIPTS from the National Forests reached a new high level in 1917, with a total of \$3,457,028. This was a gain of \$633,487 over the previous record, established in 1916. Practically every form of use of the forests was greater than ever before, according to the annual report of Acting Forester Albert F. Potter, who is in charge of the United States Forest Service during the absence of Forester Henry S. Graves with the American Expeditionary Forces in the French war zone. The chief increases were in timber receipts, which totaled \$1,692,520, a gain of \$265,525; and grazing receipts, with a total of \$1,549,794, a gain of \$339,580.

The increase in the charge for grazing privileges during the year was only 25 per cent. Further increases will be made with a view to bringing the charge to a point representing the actual forage value. It is figured that when the full advance has been made the income of the National Forests will be close to the cost of operation. There is now a deficit of less than \$600,000. Another increase in receipts equal to that of 1917 would close the gap.

During 1916 the increase in timber receipts was due to accelerated cutting under old contracts rather than to new contracts. For 1917 the total volume of sales was more than twice as large as in 1916. This showing reflects the improved demand for lumber through general business activity and the stimulus of war. The total amount of timber cut in 1917 was 840,612,000 board feet, as against 714,505,000 board feet in 1916.

War activities in the Forest Service during the year included the rendering of emergency assistance in special patrol duties in the National Forest regions, particularly in the protection of public works and transportation lines; the gathering of military reconnaissance information valuable to the War Department; the release for war service of such portion of its personnel as might be needed because of qualifications for special forms of activity or such as might have to be spared for military service, either as volunteers or under draft; and the rendering of advice or assistance to the War and Navy Departments and to manufacturers in matters relating to the supply of materials derived from the forests and required for war purposes. In addition the Service played an important part in the organization of the Forest Regiments for service in the French forests.

On aircraft the efforts of the Service have included the development of methods by which spruce and ash can be artificially dried without loss of strength and toughness, obviously involving supplementary strength tests; tests to determine the best substitutes for these species, and for each species selected the development of safe methods of artificial drying; study of the effects of steaming on mechanical properties of ash and spruce, to develop the best conditions for bending; the selection of the woods most suitable for propellers; tests to determine

the proper methods of conditioning and the best technique for propeller construction; strength tests on veneers and built-up construction; advice and assistance on specifications and the training of inspectors of wood for airplanes.

On wooden ships an attempt is being made to cover the entire field of the proper technical use of wood, including specifications, the best method of conditioning, preservative treatment against decay and marine borers, the selection of substitutes, steaming, bending and other phases.

A total gross area of 644,050 acres was added to the National Forests, as follows: 34,560 acres to the Crook, in Arizona; 1,292 acres to the Pike, in Colorado; 13,642 acres to the Teton in Wyoming, and 4,480 acres to the Missoula in Montana; 50,182 acres to the Whitman, in Oregon, and 539,901 acres to the Colorado forest, in Colorado.

Eliminations were made by presidential proclamations and executive orders from 12 forests, to a total gross area of 316,230 acres. There was also eliminated, through final approval by the Interior Department of certain state selections in two forests in Idaho and South Dakota, a total of 37,581 acres. By acts of Congress there were eliminated 83,453 acres from the Lassen and Colorado forests, for inclusion in the Lassen and Rocky Mountain National Parks.

There were within the National Forest boundaries June 30, 1917, 176,252,160 acres, including 21,085,541 acres of alienated land. The net National Forest area, or, in other words, the area actually owned by the public, was at the close of the year 155,166,619 acres.

The timber business on the eastern purchase areas, while still small in amount compared with that on the western forests, showed a decided increase. From these purchased lands 22,317,000 board feet, valued at \$51,544.49, were sold, as against 6,279,000 board feet, valued at \$6,369.23 in 1916. The amount cut was 5,435,000 board feet, valued at \$7,315.54, against 3,875,000 board feet, valued at \$3,992.70, in 1916. The material taken in these sales is largely of poor quality, and its removal is an aid in improving the composition of the stand. In a few cases the value of the material sold has equaled the price paid by the government for the land and timber. This has been due to the marked increase in the value of some minor forest products, such as chestnut acid wood.

The latter part of the summer put the National Forest Protective system to the severest test which it has experienced since the great fires of 1910, and made necessary the heaviest emergency expenditures which have been known since that disastrous year. Had it not been for the great advance which has been made in organized fire protection in the interval, there might easily have been a repetition of the widespread losses which were then suffered. The hardest part of the fight against the fires was taken by district 1, embracing Montana and northern

Idaho—the same region which suffered most severely in 1910. In Oregon and Washington the danger was not much less, but the fires on the National Forests were less extensive. Late in August the emergency expenditures for fire fighting in district 1 were for a time about \$15,000 a day. Before the fall rains brought the fire season in the Northwest to a close the emergency outlay since the beginning of the current fiscal year had reached a total of over \$950,000.

Reforestation on the National Forests involved the planting and sowing of 7,681 acres.

Grazing permits for cattle were for 1,953,198 head, as compared with 1,758,764 for the previous year, an increase of 11 per cent. For sheep the permits were 7,586,034, against 7,843,305 for 1916, a decrease of 3 per cent. In spite of this apparent decrease in the number of sheep it is stated that probably 200,000 more sheep were grazed than in 1916, as all fees had not been paid at the close of the fiscal year.

The net total of water-power permits increased during the year by 31, of which 21 were for transmission lines only.

ARMENIA AS SEEN BY AN AMERICAN FORESTER

AMERICAN foresters have a knack of getting into the thick of things. Whether in their native woods, in the Forest Regiments in the French war zone, or in other forms of service they are strong for action. Typical of this spirit is a letter just received by Raphael Zon, chief of forest investigations in the United States Forest Service, from Edward C. M. Richards at Urumia, Persia, a member of the American Forestry Association. Mr. Richards is an American forester of established reputation. He is a graduate of the Yale Forest School and was until recently a consulting forester in New York. He is now a volunteer worker of the Armenian Relief Association. His letter is a human document of much interest, as shown by the following extracts:

"The people out here grow Lombardy poplar as a timber tree. Little groves of it or now and then fair-sized patches is the nearest they come to forests. Most of it is grown in long rows along irrigation ditches. They trim it off along the trunk so that it develops into a very tall, thin tree. They use these poles as rafters, etc., in their mud houses. The really great need here is fuel wood. The people use manure cakes in their fires almost entirely, as only the wealthy can afford wood to burn. Twenty dollars (about) was the price I heard quoted for one cord. Except along the few river beds where willows, wild olive, and as far as I have seen, nothing else grow, this is a treeless country. In fact, the location of the villages is noticed by the presence of trees, which are on irrigated soil. My belief is that this is due to lack of enough water or to poor distribution of rainfall.

"Now, to get down to what can be tried out here. I have some Western yellow pine seed, and some Douglas fir. But it strikes me that some of the real desert trees of America, such as the mesquite, the Palo Verde, and especially the eucalyptus, might do well here. Also I am anxious to try out some of the dry site conifers such as the jack pine, all four of the nut pines, and any other extreme drought resisting species. It also seems to me that the ailanthus should do well on some sites here and make a welcome shade tree. Then the thought comes to me that there may be a number of Australian species which might fit and perhaps the Aleppo Pine, *Pinus halpensis*

Mill, might be worth trying out. And are there not some very hardy species that grow on the dry veldt in Africa and on the plains of the Argentine? As to the irrigated tracts it seems to me that there are better species than the Lombardy poplar. How about the American cottonwood? Could you send me a few cuttings or some seed to experiment with?

"I am writing this, and in fact we are all acting in our work, as if it was a sure thing that nothing in the way of another invasion of this district by the Turks and Kurds was going to take place. In reality we are always living on a powder mine here. There are some fifteen thousand refugees in Urumia and all around us thousands more. Three thousand fresh ones came in a little south of here about two weeks ago. Many of them were really almost naked and the poverty, famine, want and horror of it all make your heart ache. I am glad I came out to do what I could. This winter is going to be the worst that ever struck this region. Just at present it is summer and so warm that the poor people do not need clothes much. Also they manage to scrape up enough to keep alive, but when the cold starts in there will be the most terrible want that you can think of. I assure you that when you have a small mob of 50 Gilu, Kurdish and Syrian men, women and little children pressing around you, filthy, dirty, covered with sores, haggard and gaunt and all of them crying out for anything at all to eat, it makes you feel pretty hard toward the plenty of the United States and the way they are not making use of it. Why, one night's expenditures on wine, women and song along Broadway would save the lives of whole nations out here. I thought that I had seen some of the poorest people alive when I saw some of the poor people of the New York slums and the poor whites of the South, but they are bloated bondholders compared to these refugees.

"Aside from the refugee part of this country, the mixture of races is a fright. In five minutes you see Americans, Russians, Kurds, Armenians, Syrians, Gelus (Nestorians or Assyrians), Mongolians and Persians. And the mixture of language, thought and beliefs is even worse than the mixture of races. One is often thrown with people who can speak with everyone they meet! And to speak three or four tongues is nothing at all! There is

an element of excitement that adds zest to things, too. For instance, nobody who doesn't have to go out at night. There are too many bandits around. And every day you hear of murder, assault, robbery, holding for ransom, and such little things. Add to this the fact that typhoid is always epidemic, that cholera is rampant only a few miles away and that there is a regular leprosy village over near Tabriz and you see that this is an interesting country. One does not grow bored with life here by any means. He may be sitting quietly some evening and allowing his mind to drift into idle thought realms, but a couple of rifle shots in the dark out on the road will probably wake him up.

"There is one thing that makes one glad that he came here. That is the way the American missionaries have stuck to their posts. As I write there are more than nine American women and their children right here in the middle of things. And most of them went through the siege of two years ago when this compound contained some thousands of refugees and when typhus fever carried off dozens of them a day. One doctor told me of the rescue of the Christians of Goeg-Taper when one missionary went in among the Kurds while the bullets were flying all around him, talked the Kurds around, stopped the fight, and got the sixteen hundred cornered Christians to surrender their arms and then led them right through the Kurdish troops five miles to the city and safety.

"I assure you that it is a pleasure and an inspiration to be working with that fellow. And the women were just as fine, too. And now this whole region just loves these American missionaries. The day I got here I saw a big, evil-looking mountaineer, who looked like a terror, run up to Dr. Shedd and try to kiss his hand, while tears stood in his eyes. But one can easily understand it, for there would be no Urumia, and nothing but a barren waste on all sides if these men and women had not stuck to their posts. They saved the lives, property and country of probably 40,000 people, more or less. So you see I am glad to be here and I hope that I may have the chance to do my bit here where the need is so terrible. Surely I have the very best of company."

BUTTRICK'S NEW ASSIGNMENT

WORD has just been received that Mr. P. L. Buttrick, whose interesting article, "A Forester at the Fighting Front," appeared in the December issue of *AMERICAN FORESTRY*, has been appointed supervisor of construction of barracks, huts, storehouses, etc., for the American Red Cross and the Y. M. C. A. in all France. This work will call him to all the mills where the buildings are put out in lots of 50 to 100, and very likely he will have much of interest to report a little later relative to lumber industries in war times.

WHAT is said to be the smallest species of tree in the world is the Greenland birch. It reaches a height of less than three inches, though it covers a radius of two or three feet.

TREE SURGEON SAVES LEMON TREE

BY V. W. KILKECK

MR. G. W. BECK, at La Habra, California, recently saved a lemon tree, the root of which had been rotted with the gum disease called Lemon Gumosis. This disease usually starts in a small hole on the trunk near the ground and steadily grows worse until it encircles the trunk, cutting off the supply of nourishment from the root to the tree entirely and causing death.



SAVED BY ARCH-GRAFTING

Though this little tree seemed to be doomed, it is responding valiantly to Arch-Grafting and promises to be a valuable member of the community for many years to come.

By arch-grafting sucker twigs, which grew up from a lower part of the root, to the trunk of a small lemon tree, above the region which was diseased, the sick tree derived its plant food and has continued growing and producing fruit. The grafted suckers will eventually increase in size until able to support the tree after the lower part of its trunk is cut completely off its old root.

In cases where suckers do not naturally sprout from the old root a few seeds planted close to the tree may be used to create a new root system. When the seedlings are large enough they may be arch-grafted into the trunk of the sick tree in the manner described above.

TWO large mining and concentrating companies have made small-scale tests on hardwood tar as a flotation oil and have reported very satisfactory results.

FORESTRY NOTES AND COMMENTS

THE census of visitors on the National Forests of district 2 during the summer of 1917, including residential permittees, campers, hunters and fishermen, motorists, excursionists, pedestrians and other travelers, shows an increase of 47 per cent over the 1916 estimate. The total number of visitors was 984,365, divided by states as follows: Colorado, 853,307; Wyoming, 48,061; South Dakota, 62,707; Michigan, 11,755; Minnesota, 7,067; Nebraska, 1,468.

COLORADO last year experienced one of the greatest tourist seasons in its history. Over 300,000 people visited the Denver mountain parks during the months of June, July and August, and over 100,000 people visited Estes Park. The National Forests also shared in this increased travel. Late reports from supervisors, based on a tally of visitors and data secured from railroads, resorts, etc., indicate that there were over 845,000 recreation visitors between May 1 and October 31, and 142,500 automobiles are reported to have toured the forests. The time spent by campers, sportsmen and motorists averaged two days each.

THE annual game reports from the Bighorn, Rio Grande, and Sopris National Forests indicate a healthy increase in the number of elk and deer over last year's figures. Mountain sheep, while holding their own on the Rio Grande, show a material increase on the Bighorn and Sopris. Beaver were also reported increasing on the Bighorn and Rio Grande. Bears show a slight increase on the Bighorn and Sopris. Forest officers from the Carson and Sante Fe report an alarming shortage of blue grouse this year. It is believed that a year-long closed season on these birds is necessary.

ASPEN telephone poles are giving satisfactory service in district 3 of the United States Forest Service, according to a report to the Washington office. On the Manzano National Forest treated aspen poles are in good condition six years after being set. On the Carson untreated aspen poles which were set when green were found to be in good condition after all the yellow pine and Douglas fir poles, set at the same time, had rotted off at the ground. The main objection to aspen is based on its tendency to become brittle with age. This can be overcome by selecting good-sized poles.

W. G. SKELTON, living near Meridian, Mississippi, has a piece of fat pine which is in a remarkable state of preservation after more than half a century's immersion in water. Mr. Skelton put this piece of pine into a mud sill in Sowashee Creek in 1867. A few days ago he had occasion to do some work on the mud sill and found it in perfect condition.

IN a recent address Director James W. Toumey, of the Yale Forest School, said: "I believe that the future of American forestry depends to a far greater extent than most of us realize upon the private land owner. Four-fifths of the forests of the country are privately owned. They constitute the forest lands of greatest potential productivity. As the billions of feet of timber now cut annually from these private lands are felled, will it pay the owners to protect the cut-over areas and attain complete reproduction by either natural or artificial means? Protection must be afforded and reproduction attained for the future welfare of the nation and for national defense. It is far more important to the nation than to the individual that the second growth be adequately safeguarded. The nation, therefore, by liberal tax laws and technical assistance must help the private owner to attain a protected reproduction and thus secure a satisfactory second growth. High and uncertain taxes on privately owned land maintained in forest crops and illiberal public policy in rendering assistance in fire protection and in reforestation, is short sighted and very unwise. For the good of the nation the private owners must be encouraged and helped toward better forest reproduction and toward protection of the second growth. It is up to the public. It is just as much the business of the nation and state to encourage the best use of the absolute forest land as it is the best use of the agricultural land."

THE National Forest Reservation Commission has authorized the purchase of 65,923 acres of land in the Southern Appalachians and White Mountains, for inclusion in the eastern National Forests. The Commission has resolved to refuse to make further purchases in Georgia until after the repeal of hostile legislation passed by the State legislature last summer. About 27,800 acres on the Savannah and Georgia purchase areas, which were recommended to the Commission, will be held up by this resolution. The Commission also refused to approve the purchase of a tract on the Unaka Area in Tennessee, for which a higher price than that agreed to by the owner was awarded by the jury in condemnation proceedings brought with the owner's consent to clear the title.

BLACK walnut, which has always been the favorite wood for gun stocks on account of its failure to splinter badly when struck by a bullet or bit of shell, is extremely scarce in this country at present. Birch and maple are being tried out by producers of hardwood lumber for this purpose.

ONE of the state forests in Pennsylvania is supplying large quantities of cordwood to consumers at reasonable prices.

ASIDE from the numerous edible mushrooms, roots, fruits of shrubs and smaller plants, the trees of the American forests afford a large variety of edibles. First in importance, of course, are the native nuts—beech nuts, butternuts, walnuts, chestnuts and chinquapins, hazel nuts and several kinds of hickory nuts, including pecans. The kernels of all of these are not only toothsome but highly nutritious and are used by vegetarians to replace meat. The oil of the beech nut is said to be little inferior to olive oil, while that of butternuts and walnuts was used by some of the Indians for various purposes. The Indians, it is said, also formerly mixed chestnuts with cornmeal and made a bread which was baked in corn husks, like tamales. In parts of Europe bread is made from chestnuts alone. Several western pines have seeds which play an important part in the diet of the local Indians. Perhaps the best known of these is the fruit of the nut pine or pinon, which forms the basis for a local industry of some size. Not only is it extensively eaten by local settlers and Indians, but large quantities are shipped to the cities where the seed is roasted and sold on the street.

CHICAGO has entered upon a remarkable forestry scheme. The city is to be completely surrounded by woods, with the exception of the Lake Michigan side. There will be a great half-circle of forest preserves starting from the lake shore to the north, and running around to the west and south, enclosing the whole suburban area. About 1,000 acres have already been planted, at a cost of \$3,000,000, and \$8,000,000 more is to be spent on the project, under powers granted Cook county by the state legislature.

It is not a mere "reforestation" plan, making amends to nature for the destruction of aboriginal forests. It is an improvement on nature. Most of the area constituting the new forest belt was open prairie land when the white man first saw it.

AN extensive lecture campaign on range management is being conducted by the United States Forest Service in district 4 in co-operation with the States Relations Service of the Department of Agriculture. These illustrated lectures are devoted mainly to co-operative management of cattle on National Forest ranges. Approximately eighty communities within the intermountain region will be visited before spring.

TWO sales of timber, totaling 4,600,000 feet, on the Olympic National Forest, have been made to the C. P. Adams Lumber Company, of Aberdeen, Washington. For 3,000,000 feet a price of \$5.76, or \$1.26 per thousand higher than the advertised price, was obtained. Spruce will be the only species cut, except for the small amounts of cedar, Douglas fir, and hemlock needed in logging operations.

ALL Arizona supervisors of the United States Forest Service have been appointed deputy health inspectors by the State Board of Health.

SOUTHERN pine mills are now cutting more ship timbers for the nation's wooden fleet than available railroad facilities can transport to ship yards. Growing seriousness of the car shortage is reported all through the South.

Considerably over a million feet a day of ship timbers are now being cut by Southern pine plants, and with the speeding-up program recently put into effect it is hoped within a month to increase this to 2,000,000 feet a day. A large number of additional cars will be necessary, however, to move this stock to shipbuilding points.

The car shortage is reported particularly bad along the Mobile and Ohio Railroad. The Robinson Land and Lumber Company, at Chicora, Mississippi, was recently declared to be "snowed under" with government stock that it was unable to ship, and repeated appeals for cars have met with no response. The Batson-McGehee Company, at Milliard, Mississippi, was said a few days ago to be entirely without cars, although it had ready for movement seven carloads of ship timbers waiting to go to shipyards. A similar situation exists with the Marathon Lumber Company, Laurel, Mississippi, also the Wausau Southern at Laurel, and at many other points.

Southern Pine Association inspectors write in from all parts of the Southern pine producing territory that "transportation difficulties are very serious and growing worse."

TEN thousand soldiers are being sent into the woods of the Northwest as the Spruce Production Division of the Signal Corps. Their duties are to get out spruce and fir for airplane stock. These men are volunteering from Western National Army camps and from civil life and from other services to counteract the trouble caused by I. W. W. agitation in western lumber camps. A monthly production of 15,000,000 board feet of spruce is required to take care of the extra needs for the aircraft construction program, and small operators are being encouraged to get out rived timbers in order to speed up production. Four New York State College of Forestry students have enlisted in these logging squadrons and have left Syracuse for Vancouver Barracks.

BEGINNING with early spring, Gulf and Atlantic shipyards will launch a wooden ship a day, according to J. E. Rhodes, secretary-manager of the Southern Pine Association. The output of ship timbers by Southern pine mills has been doubled and now amounts to considerably more than a million feet a day. It is hoped to increase production eventually to 2,000,000 feet a day, and enable shipyards to operate on 24-hour schedules.

ADVERTISEMENT has been authorized for 24,000,000 feet of spruce and 750,000 feet of hemlock on Long Island on the Tongass National Forest of Alaska. This body of spruce is said to be as fine as any in Alaska. It will be advertised in two blocks of 16,000,000 and 8,000,000 feet, at \$2.50 per thousand for spruce and 50 cents per thousand for hemlock.

AMERICAN FORESTERS IN MILITARY SERVICE

This list is compiled from various sources. Every effort has been made to make it complete and accurate, but in the nature of things there are necessarily omissions and errors. The list will be reprinted and increased from month to month. All foresters and others who can supply additional names or note corrections are urged to communicate with American Forestry as promptly as possible, to the end that the list may have full value as a record of the men who have gone to war.

- A** GEE, Fred B., Deputy Forest Supervisor, U. S. F. S.
 Albano, Jack, forest ranger, U. S. F. S.
 Alden, E. E. (Mich. Ag. Col., '15).
 Aldous, Tura M., grazing, U. S. F. S.
 Aldsworth, Donald (Univ. of Minn., '14), Off. Tr. Camp, Presidio, Calif.
 Alexander, Ben. (Bilt. For. School), 2nd R. O. T. C.
 Alexander, J. B., 1st Lt. Aviation Corps (Univ. of Wash., '17).
 Allen, Raymond, New Jersey.
 Ames, F. E. (Yale For. School, '05).
 Anderson, A. C., 2nd Lt. U. S. A. (Univ. of Wash., '17).
 Anderson, Emil A., deputy forest supervisor, U. S. F. S.
 Anderson, Parker O. (Univ. of Minnesota, '18), 10th U. S. Eng. (Forest), U. S. F. S.
 Archer, Frank L., forest clerk, U. S. F. S.
 Armstrong, Carroll W. (Bilt. For. School), Quartermaster's Dept., Fort Dodge.
 Armstrong, Ralph H. (Bilt. For. School), 104th Inf., Expeditionary Forces, France.
 Atkinson, E. S. (Yale For. School, '16).
 Atwood, C. R. (Univ. of Maine, '15), manager, Unit 1, New England Sawmill Units.
 Avery, B. F., commissioned in Eng. (Forest) forces; (Yale For. School); Spanish River Pulp and Paper Mills.
 Aylward, F. N. (Univ. of Calif.), Amb. Corps.
- B** ACKUS, Romaine L. (Univ. of Minn., '18), 20th U. S. Eng., U. S. F. S.
 Badertscher, Ed., temp. clerk, U. S. F. S.
 Baker, Hugh P. (Yale For. School, '04), Capt. 46th U. S. Inf., Camp Taylor, Louisville, Ky., N. Y. State Col. of Forestry.
 Baldenburg, Max B., clerk, U. S. F. S.
 Baldwin, H. C. (Penn. State, '14).
 Ballou, F. C. (Penn. State, '16), 20th Eng. (For.), U. S. F. S.
 Barker, S. Omar, Co. D., 502nd Service Bn., Camp Merritt, N. J., U. S. F. S.
 Barlow, Harold (Yale For. School, '14).
 Barr, John B., forest ranger, U. S. F. S.
 Barton, Robert M., 20th Eng. (Forest), Amer. Univ., Wash., D. C.; forest ranger, U. S. F. S.
 Bastian, Clyde E., Corp. 20th Eng. (For.), (Univ. of Mich., '16).
 Batten, R. W. (Yale For. School, '16).
 Beaman, Clarence W., messenger, U. S. F. S.
 Beattie, Homer Milo (Mich. Univ., '04), Sgt. 10th Eng. (For.).
 Bedwell, Jesse L., forest ranger, U. S. F. S.
 Behre, C. Edward, 20th Eng. (For.), Amer. Univ., Wash., D. C., U. S. F. S.
 Bell, Ernest (Univ. of Minn., '16), Lt. Rainbow Div., Camp Mills, N. Y.
 Bell, George R. (Yale For. School, '18).
 Bellue, A., 10th Eng. (For.).
 Beltz, H. C., 1st Lt. (Mich. Ag. Col., '18).
 Benedict, M. S., 1st Lt. 10th Eng. (Forest), for sup., U. S. F. S.
 Benedict, Raymond E., Major 10th Eng. (For.), For. Br. B. C.
 Bennett, William W. (Univ. of Nebr., '12), Co. E. 314th Ammunition Train, Camp Funston; Fort Riley, Kansas, dep. for sup., U. S. F. S.
 Bentley, George A., Capt. Quartermaster's Dept., purchasing agent U. S. F. S.
 Bennett, Edwin L., forest ranger, U. S. F. S.
 Bennett, William W., Co. E. 314th Am. Train, Camp Funston, Ft. Riley, Kansas, U. S. F. S.
 Bernhardt, Carl L. (Univ. of Wash., '18).
 Berry, John K., scaler, U. S. F. S.
 Berry, Swift, forester, U. S. F. S.
 Betts, Fred H., forest ranger, U. S. F. S.
 Beyers, Walter F. (Univ. of Minn., '12), Capt., Camp Dodge, Iowa.
 Bevan, Arthur, (Univ. of Wash., '17).
 Billin, R. T. (Penn. State, '20), 10th Eng. (For.).
 Billings, R. W. (Mich. Ag. Col., '17), 10th Eng. (Forest).
 Billingslea, James H., Jr., Top Sgt. (Univ. of Wash., '14), forest ranger, U. S. F. S.
 Bird, R. J., Corp. 20th Eng. (Forest), (Cornell, '16).
 Bird, Vern A., 20th Eng. (For.), forest ranger, U. S. F. S.
 Blake, Philip (Univ. of Minn., '16), Marine Barracks, Quantico, Va.
 Bloom, Adolph, Ensign U. S. N. Train Sta. (Univ. of Wash., '16).
 Bonney, Parker S., sub. lt., Br. Navy (Univ. of Wash., '13).
 Bosworth, James H. 20th Eng. (For.), Amer. Univ., Wash., D. C., U. S. F. S.
 Bowen, John S., 20th Engineers (Forest), Amer. Univ., Wash., D. C., U. S. F. S.
 Bowen, Jos. B. (Yale For. School, '17).
 Boyce, W. H. (Penn. State, '17).
 Bradley, Tom O. (Mt. Alto), Pa. Dept. For.
- Brady, Charles C. (Univ. of Wash., '18).
 Brady, Seth C., messenger, U. S. F. S.
 Brayton, Shirley (Univ. of Minn., '18), 20th U. S. Eng., Washington, D. C.
 Breneman, Howard E. (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.
 Brewster, Donald R., forest examiner, U. S. F. S.
 Brinckerhoff, H. E. (Yale For. School), 1st Lt. Inf.
 Brindley, Ralph, 2nd Lt. R. O. T. C. (Univ. of Wash., '17).
 Brockway, M. (Univ. of Me., '15), checker, Ten Saw Mill Units.
 Broderick, Martin J. (Univ. of Minn., '16), 1st Sgt. U. S. Engr. Co. C, 501 BN., Engr., 20th Eng.
 Brooks, James F., forest ranger, U. S. F. S.
 Brown, Bascom H., forest ranger, U. S. F. S.
 Brown, R. A., Co. D, 23rd Eng. (Highway), Camp Meade, Md., U. S. F. S.
 Brown, Thomas (Univ. of Minn.), Marines, A. E. F., France.
 Brown, Vance, scaler, U. S. F. S.
 Browning, Harold A., asst. for ranger, U. S. F. S.
 Broxon, Donald (Univ. of Wash., '14).
 Bruce, Donald (Yale For. School, '10); assigned in charge of timber, reconnaissance in France. (Prof. of For. Uni. of Cal.).
 Bruce, James, U. S. F. S.
 Brundage, Marsden R. (Mich. Ag. Col., '17), 20th Eng. (Forest).
 Bryant, Edward S., Capt. 10th Eng. (Forest), for ins., U. S. F. S.
 Buch, John Edward (Mt. Alto For. Acad., '17), Co. C, 10th Eng. (Forest), Pa. Dept. For.
 Buck, Shirley, National forest inspector, U. S. F. S.
 Buhler, Ernest (Univ. of Minn., '13), Sgt.
 Bullerdick, Ray O., Sgt., Supply Office, Camp Talliaferro, No. 1, Fort Worth, Tex. (Asst. Forest Ranger, U. S. F. S.).
 Bunker, Page (Yale), city forester, Fitchburg.
 Burgess, John, surveyor draftsman, U. S. F. S.
 Burleigh, T. D. (Penn. State, '18), 20th Eng. (Forest).
 Burnham, R. P. (Univ. of Wash., '17).
 Burt, E. H., Lt. (Mich. Ag. Col., '14).
 Buttrick, P. L., Am. Amb. Serv. (Yale For. School, '11).
 Byrne, Geo. J., Jr., Amb. Corps.
- C** ALKINS, Hugh G. (Yale For. School, '09), forest supervisor, U. S. F. S.
 Calloway, G. A. (Univ. of Mo.).
 Calloway, Joseph R., forest ranger, U. S. F. S.
 Calvert, Gerald F. (Univ. of Wash.).
 Cameron, J. F. (Univ. of Wash., '19).
 Cappel, Frederick, for clk., U. S. F. S.
 Carney, Thos. J., Sgt., 38th Co. 10th Battalion, 166th Depot Brigade, Camp Lewis, American Lake, Washington, U. S. F. S.
 Carpenter, Herbert M. (Bilt. For. School), 20th Eng. (Forest).
 Cassidy, Hugh O., forest ranger, U. S. F. S.
 Cecil, Kirk P., Lt., Fort Stevens, surveyor, U. S. F. S.
 Chamberlain, Harry (Penn. State, '14), 20th Eng. (Forest).
 Chapman, Charles S., Maj. 10th Eng. (Forest), (Yale For. School, '02), forestry assistant, U. S. F. S.
 Chartrand, Lee F., 20th Eng. (Forest), forest ranger, U. S. F. S.
 Chartrand, L. J. (Mich. Ag. Col., '14).
 Charlson, Alex. (Univ. of Wash., '16).
 Cheatham, J. W., Corp. (Mich. Ag. Col., '19).
 Christensen, Alfred C., forest clerk, U. S. F. S.
 Chubb, S. W. (Penn. State), U. S. F. S.
 Chudderdon, Harold A., forest ranger, U. S. F. S.
 Clark, Donald H., 1st Lt. R. O. T. C. (Univ. of Wash., '17).
 Clark, E. V., 1st Lt.; R. O. T. C., forest supervisor, U. S. F. S.
 Clementsen, Harold, 2nd Lt. (Mich. Ag. Col., '17).
 Clemmons, Walter C., forest ranger, U. S. F. S.
 Colgan, J. G., 1st Lt. (Mich. Ag. Col.).
 Colledge, Edward W. (Bilt. For. School), Am. Amb. Serv., France.
 Colburn, H. C., 10th Eng. (Forest), Co. B., Expeditionary Forces, France, U. S. F. S.
 Condon, H. R. (Penn. State, '12), 2nd Lt. 10th Eng. (Forest), Pa. R. R. forester, Phila., Pa.
 Cone, Theodore (Univ. of Minn.), Santiago de Cuba, care of Postmaster, N. Y.
 Conklin, J., 20th Eng. (Forest).
 Conklin, W. Gardiner, 1st Lt. 20th Eng. (Forest), (Pa. State For. Acad., '08), Pa. Dept. Forestry.
 Cook, A. M. (Yale For. School, '08).
 Cook, John W., clerk, U. S. F. S.
 Cook, G. D. (Mich. Agri. College), 1st sergt. 10th Eng. (Forest).
- Cook, H. O., Capt., 2nd Forest Regiment, Mass.
 Cook, Samuel, forest ranger, U. S. F. S.
 Cookston, Roy, Capt. 10th Eng. (Forest).
 Cool, Frank J., 25th Engineers, Camp Devens, Mass. (Topographic Draftsman, U. S. F. S.).
 Cool, W. C., 2nd Lt. (Cornell, '16).
 Coolidge, Lieut. Joseph (Harvard, '12), 20th Eng. (Forest), consulting forester.
 Cope, H. H. (Penn. State, '15), 10th Eng. (Forest).
 Cope, H. Norton, forest ranger, U. S. F. S.
 Copsey, C. N., 10th Eng. (Forest).
 Cortright, L. J., 2nd Lt. (Mich. Ag. Col., '11).
 Cowan, T. DeWitt, 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.
 Cownan, Talmadge D., forest ranger, U. S. F. S.
 Cox, Windsor G., U. S. F. S.
 Crane, Leo (Univ. of Minn., '16).
 Crawford, C. B. (Mich. Ag. Col., '13).
 Critchley, Horace F. (Mt. Alto, '13), Res. Off. Tr. Camp, Ft. Niagara, Pa. Dept. For.
 Crocker, E. S. (Mich. Ag. Col., '18).
 Crookston, Byron F., 20th Engineers (Forest), Am. Univ., Wash., D. C., U. S. F. S.
 Crowell, Lt. Lincoln J. (Yale, '08, Bilt., '11), 20th Eng. (Forest), U. S. F. S.
 Crumb, Isaac J. (Univ. of Wash., '20).
 Cuff, Ivan A., forest ranger, U. S. F. S.
 Culley, Matthew J., forest ranger, U. S. F. S.
 Cummings, T. S. (Univ. of Minn., '14), Av. Corps, Ft. Houston, Tex.
 Cuno, John B. (Penn. State, '15), 2nd Lt. 20th Eng. (Forest).
 Curwen, William H., surveyor-draftsman, U. S. F. S.
- D** ALLENBACH, Emil, messenger, U. S. F. S.
 D'Amour, Lt. Fred. E., 33rd Inf., Co. L., O. R. C.
 Davis, V. B., 20th Eng. (Forest).
 Dean, Forrest W. (Ohio State Univ.), U. S. F. S.
 De Camp, J. C., grazing assistant, U. S. F. S.
 Deering, Robert L., 1st Lt. 10th Eng. (Forest), forest examiner, U. S. F. S.
 Denia, Henry M. (Univ. of Minn., '15).
 Deutsch, Henry C., forest ranger, U. S. F. S.
 Devine, Lt. Robert (Mass. Inst. Tech.), training camp.
 Dodd, C. T., 20th Eng. (Forest).
 Dodge, Alex. W. (Yale), 1st Sergt. 32nd Co., 8th Bat. Camp Lewis, Amer. Lake, Wash.
 Doggett, William H. (Yale For. School, '17).
 Dollenmeyer, Stacy B. (Univ. of Minn.), U. S. S. Armais, Sp. 418, care of Postmaster, N. Y.
 Dorrance, John Gordon (Biltmore, '10), 2nd Lt. E. O. R. C., Md. State Board of Forestry.
 Dorward, D. L. (Yale For. School, '14).
 Douglass, C. W. H., Av. Corps (N. Y. State Col. of Forestry, '15), Royal Flying Squadron, England, American Forestry.
 DuBois, Coert, Maj. 10th Eng. (Forest), dis. forester, U. S. F. S.
 Dubuar, James F., forest assistant, U. S. F. S.
 Duke, J. B. (Penn. State, '20), 10th Eng. (Forest).
 Dunbar, Roger S. (Bilt.), 20th Eng. (Forest).
 Dunn, Beverly C., Adjutant 10th Eng. (Forest).
 Dunn, Frank (Univ. of Minn., '15), 151st F. A. Bat. F. Camp Hill, Newport News, Va.
 Dunn, L. D. (Penn. State, '16), 10th Eng. (Forest).
 Dunning, Duncan, forest assistant, U. S. F. S.
 Dunning, Earle (Bilt.), Quartermaster's Dept.
 Dunston, Clarence R., 1st Lt. U. S. Indian Service.
 Dunwoody, Capt. W. Brook (Yale, '16), 3rd Field Art., Ft. Myer, Va., 2nd Asst. State Forester Va.
- E** DDY, Ben, 23rd (Highway) Engineers, U. S. F. S.
 Eddy, H. J. (Mich. Ag. Col., '18).
 Edwards, William G., Co. C, 10th Eng. (Forest), Instructor in Forestry at the Penn State College.
 Egnor, James W., MacCormack State Park, Indiana.
 Eldredge, Inman F., Capt. 10th Eng. (Forest), forest supervisor, U. S. F. S.
 Elliott, Harry R., forest ranger, U. S. F. S.
 Elliott, F. A., 10th Eng. (Forest).
 Ellis, Ralph T., woodsman, Ten Sawmill Units (Mass. For. Dept.).
 Emerick, Lloyd P., forest clerk, U. S. F. S.
 Emerson, Fred D. (Bilt.), Camp Dix.
 Emerson, J. Ward, forest ranger, U. S. F. S.
 Estill, Davis H. (Bilt.), corp. Inf.
 Eucher, Wm H. (Bilt.), 20th Eng. (Forest).
 Evans, Vincent (Univ. of Wash., '16).
 Everett, E. W., 20th Eng. (Forest).
 Ewing, Robert B., forest ranger, U. S. F. S.

F AIRCHILD, Rollin A., forest clerk, U. S. F. S. Fifer, Charles (Univ. of Wash., '20).
 Filler, E. C. (N. Y. State Co. of Forestry), U. S. F. S.
 Fish, Hard (Univ. of Wash., '18).
 Fisher, David (Univ. of Wash., '14).
 Fisher, G. K., 1st Lt. (Mich. Ag. Col., '15).
 Foess, Jacob E. (Mich. Ag. Col., '17), 20th Eng. (Forest).
 Foley, A. C., Corp. 20th Eng. (Forest), (Univ. of Mich., '18).
 Foran, Harold (Univ. of Wash., '16).
 Ford, Earl J., woodsman, Ten Sawmill Units, England (Mass. Forestry Dept.).
 Ford, Elmer R. (Penn. State, '14), Officers' Training Camp, Fort Myer (Asst. For. Md. St. Bd. of For.).
 Forester, M. H., 41st Co., 11th Bat., Camp Zachary Taylor, Louisville, Ky.
 Forsberg, Carl (Univ. of Minn., '17), 10th U. S. Eng. A. E. F. France.
 Fowler, Frederick H., district engineer, U. S. F. S.
 Frankland, James, 1st Lt., Oregon Coast Artillery, forest ranger, U. S. F. S.
 Franklin, E. N., U. S. F. S.
 Freeman, George (Univ. of Minn., '14).
 Fritchley, C. R. (Univ. of Mo.).
 Fritz, Emanuel (Yale For. School, '14), forest asst., U. S. F. S.
 Freedman, Lt. Louis J. (Harvard), Eng. Corps (Forest).
 Frey, E. (Cornell, '17), 10th Eng. (Forest).
 Fullenwider, William G. (Bilt., 10th Eng. (Forest)).
 Fuller, Francis S., forest assistant, U. S. F. S.

G ALER, George E., forest ranger, U. S. F. S. Gallaher, W. H., 2nd Lt. (Yale For. School, '10), U. S. F. S.
 Garrett, C. B. (Univ. of Wash., '16).
 Gavitt, R. M., U. S. Naval Reserve (Cornell, '17).
 Gaylord, Donald (Yale For. School, '15), 10th Eng. (For.).
 Gearhardt, Paul H., Battery E., 316 Reg., H. F. A., Camp Jackson, S. C.
 Geary, H. O., 20th Eng. (Forest).
 Gebo, L. W., 20th Eng. (Forest), (Cornell, '16).
 Gibbons, William H., 2nd Lt., forest examiner, U. S. F. S.
 Gipple, O. B. (Penn. State, '15), 10th Eng. (For.).
 Gilchrist, M. F. (Mich. Ag. Col., '19), 10th Eng. (Forest).
 Gill, Thomas H. (Yale For. School, '15), forest ranger, U. S. F. S.
 Gilman, John, forest ranger, U. S. F. S.
 Gilson, R. M. (Yale For. School, '17).
 Ginter, P. L. (Mich. Ag. Col., '19), 20th Eng. (Forest).
 Girk, Royal J., forest clerk, U. S. F. S.
 Given, J. Bonbright, 1st Lt., Camp Jackson, S. C. Godwin, D. P., 1st Lt., 10th Eng. (Forest), forest exam., U. S. F. S.
 Gooch, Winslow L., 10th Engineers (Forest), Am. Exped. Forces, France, U. S. F. S.
 Goodman, Walter F., forest ranger, U. S. F. S.
 Gowen, Geo. B., Coast Artillery.
 Graham, Paul (Univ. of Wash., '13).
 Granger, Christopher M., Capt. (Mich. Ag. Col., '07), Headquarters, Am. Exped. Forces, France, Assistant Dist. Forester, U. S. F. S.
 Graves, Henry S., Lt. Col., director, division of forestry headquarters, Am. Exped. Forces; United States Forester.
 Gray, Harry A., Co. C, Eng. (For.), Am. Exped. Forces, France.
 Greathouse, Ray Livingston, Co. A., 362 Inf., Camp Lewis, American Lake, Wash., U. S. F. S.
 Greeley, William B., Maj., deputy director, division of forestry headquarters, Am. Exped. Forces; assistant United States Forester.
 Grefe, Raymond F., forest ranger, U. S. F. S.
 Green, R. S. (Cornell, '19), 20th Eng. (Forest).
 Greve, L. T. (Mich. Ag. Col., '16).
 Grinnell, Henry (Bilt.), Forest Regiment.
 Guthrie, John D. (Yale For. School, '06), forest sup., U. S. F. S.
 Guthrie, Richard T., 1st Lt., 17th F. A., U. S. A., Camp Robinson, Wis. (Univ. of Nebr., '13), forest examiner, U. S. F. S.
 Gwin, Clyde M., 382nd Inf., Co. M, American Lake, Tacoma, Wash., U. S. F. S.

H AAIS, F. W. (Yale For. School, '13), Regular Army, Medical Dept.
 Hackett, William, forest ranger, U. S. F. S.
 Hagon, Jules L., 20th Engineers (Forest), for. ranger, U. S. F. S.
 Hall, A. F., 20th Engineers (Forest).
 Hall, F. B., woodsman, Ten Saw Mill Units, Mass. Dept. of For.
 Hall, R. C. (Yale For. School, '08), forest examiner, U. S. F. S.; assigned to timber reconnaissance in France.
 Hall, Stanley B. (Harvard, '09).
 Hamlin, E. G., 2nd Lt. (Mich. Ag. Col., '16).
 Hammer, George C., Neopit Indian Mills, Neopit, Wis.
 Hammond, Charles P. (Biltmore), 20th Engineers (Forest).
 Hansen, Harvey L. (Univ. of Calif.), Amb. Corps.
 Hansen, Thorvald (Yale For. School, '17), forest asst., U. S. F. S.

Hanson, Arnold (Yale For. School, '17).
 Harding, Charles C. (Yale For. School, '16).
 Harlachner, Josef (Mt. Alto, '17), 20th Eng. (Forest), 1st Bat., Pa. Dept. For.
 Harley, Percy H., forest clerk, U. S. F. S.
 Harley, William P. (Ames Forest School), 10th Eng. (Forest).
 Harmelling, H. (Univ. of Wash., '12).
 Harrington, Neal (Mich. For. School, '12), Company G, 31st Inf., Camp Grant, Rockford, Ill.
 Harris, Alvin E., 20th Engineers (Forest), Am. Univ., Wash., D. C., U. S. F. S.
 Hausherr, F. E. (Mich. Ag. Col., '17).
 Hawkinson, Carl (Univ. of Minn., '15), 10th Eng. (Forest), U. S. F. S.
 Haworth, Robert (Univ. of Minn., '13).
 Hendrickson, Guy C., forest clerk, U. S. F. S.
 Hendrix, Albert W., forest ranger, U. S. F. S.
 Henry, D. D., 2nd Lt. (Mich. Ag. Col., '15).
 Henwood, C. H. (Penn. State, '14), National Army.
 Hetrick, R. E. (Mich. Ag. Col.), Forestry Dept., U. S. F. S.
 Hicock, Henry W. (Yale For. School, '15), 504th Eng. Battery Service.
 Hicks, L. E., forest ranger, U. S. F. S.
 Hill, F. C., forest ranger, U. S. F. S.
 Hill, Rollin C., 10th Engineers (Forest), Am. Exped. Forces, France, U. S. F. S.
 Hilliard, L. E., woodsman, Ten Saw Mill Units, England; Mass. For. Dept.
 Hise, E. C. (Yale For. School, '09), State for., New Hampshire.
 Hodgman, Arthur (Univ. of Minn., '12), 10th Eng. (Forest), U. S. F. S.
 Hogentoler, Joseph R. (Mt. Alto, '12), with Governor's troops, Pa., Pa. Dept. For.
 Holdsworth, R. P., Capt. (Mich. Ag. Col., '11).
 Holt, Felix R. (Yale For. School, '02).
 Honeycutt, E. E., 20th Engineers (Forest).
 Hotze, E. B. (Univ. of Mo.).
 Hope, L. S. (Yale For. School, '16).
 Houtz, William E. (Mt. Alto, '09), 20th Eng. (Forest), formerly Pa. Dept. For.
 Houtz, Jesse (Mt. Alto, '13), Field Artillery, Camp Meade, Md., Pa. Dept. For.
 Huff, Roland, forest ranger, U. S. F. S.
 Hugo, P. (Penn. State, '19), National Army.
 Hull, J. H. (Yale For. School, '11).
 Humphrey, J. C. H. (Yale For. School, '09).
 Hussey, Ralph W., forest ranger, U. S. F. S.

I NGALLS, E. E. (Yale For. School, '17).
 Inskeep, Raymond P., Machine Gun Co., 157th Inf., Camp Kearney, Calif., forest ranger, U. S. F. S.
 Isola, Vico C. (Yale For. School, '14).
 Irwin, James A. (Mt. Alto, '12), Sgt., 10th Eng. (Forest), France, Pa. Dept. For.

J ANOUCH, Karl L., 20th Eng. (For.), Am. Exped. Forces (Univ. of Nebr., '17).
 Jeffrey, Walter (Cornell, '18), Ensign in the Navy, Battleship "Missouri."
 Jensen, A. F., U. S. F. S.
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 Johnson, R. J. (Mich. Ag. Col., '16).
 Johnson, W. R. (Mich. Ag. Col., '12).
 Jones, Luther G. (Yale For. School, '16).
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 Ringland, Arthur C., Capt. 10th Eng. (Forest).
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 Roberts, Wesley K. (Univ. of Wash., '18).
 Robertson, Colin C. (Yale For. School, '07).
 Robertson, J. M. (Mich. Ag. Col., '19), U. S. F. S.
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 Simpson, C. E. (Penn. State Col., '16), died in Scotland October 3, 1907.
 Sirmpp, R. A. (Penn. State Col., '18), Amb. Corps.
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EDITORIAL

THE WAR AND THE WHITE PINE BLISTER RUST

A CONFERENCE of those interested in the control of the white pine blister rust was held recently at Pittsburgh, Pennsylvania. As a result of the discussion, the Committee on the Suppression of the Pine Blister Rust in North America decided to labor for the continuance of the work along present lines so far as consistent with the urgent needs of the war. The developments of this year have shown that the situation is even more serious than was known to be the case a year ago. It is plain that the blister rust is thoroughly entrenched and that it cannot be eradicated by human agencies. What may be hoped to be accomplished is: first, to enforce the present quarantines against the movement of five-leaved pine and Ribes nursery stock; second, to keep the disease from becoming established west of the Great Plains; third, to delay for many years the progress of infection in the Lake States; and, fourth, to develop cheap and practical methods of local control in the best pine areas of the Eastern States. Emphasis is laid upon these four phases of practical work in the order in which they are named.

How much money must be spent on blister rust control during the present war crisis is a question which cannot be answered solely from the forestry viewpoint. It depends quite as much upon the course taken by the war during the next six months and the need which will become apparent during the winter for labor and for increased production of agricultural crops. All who attended the conference recognized that the welfare of the nation demands that work in many important lines must be held down to a minimum, in order to liberate men who will be urgently needed when the full effect of the draft is felt.

The three great war needs which stand above all others at the present time are more ships, more food, and more men. Present indications are that food production may be dangerously decreased next year because the shortage of labor is expected to be several times more acute than during the past year. Probably 600,000 trained men from the farms will be called under the selective draft before another summer arrives. This equals about ten per cent of the trained farm laborers and if they can be replaced at all, it must be by untrained and unskilled men. Farming is a specialized occupation requiring skill and experience as well as brawn. It will demand almost superhuman effort to bring next year's crop production up to this year's total, and the need for our food by our Allies will be greater than ever before in history. For this reason we are strongly of the opinion that labor should be diverted from war work only where delay will cause irreparable damage.

The American Forestry Association is entirely in accord with the recommendations of the committee for

continuation of present appropriations for blister rust control. Under normal conditions, the Association would vigorously urge a substantial increase in both state and federal appropriations and a large extension of practical work. Under war conditions, it is felt that present efforts should be limited to work which cannot be done as well after the war. In the far West it will be impossible to control the blister rust if the disease once becomes established there, and the loss in that case will be appalling. Only good fortune has kept the western white pine region so far free from this disease. It is therefore extremely important to enforce the quarantine against the transportation of pine and Ribes west of the Great Plains and to continue the search for possible importations of the disease now existing in that territory. In spite of the war, the efforts to protect the western white pines should be increased, since a very small expenditure at this time can prevent huge loss in the future. In the Lake States, because the disease is not thoroughly established, we have the opportunity of checking its spread from present infection centers until it advances into Michigan from Ontario. In order to save the Lake States from invasion from the South or from planted nursery stock, the present efforts to locate and destroy the disease in the states lying between the Mississippi River and the Hudson Valley should also be continued. Later, if it appears that the disease is making greater headway than this year's finding indicate, these efforts should be increased. A comparatively insignificant sum may save millions of dollars' worth of native young pine growth in the Lake States from general infection for many years to come.

The result of this year's work in the Hudson Valley and in New England encourage us in the belief that wild currants and gooseberries can be uprooted at a reasonable cost. The attitude of the public is favorable to the removal of cultivated currants and gooseberries wherever this is necessary to protect the pines. Control of the disease in advance spot infections has proved successful wherever it has been possible to eliminate all currant and gooseberry bushes. Control of the blister rust on a large scale will be possible in regions of general infection if labor costs are not prohibitive. The experts are agreed that the blister rust works slowly; nevertheless, a few years' delay in undertaking control on a large scale will undoubtedly result in considerable loss. However, the damage will not be irreparable if work can be rushed just as soon as the need for labor to prosecute the war is abated.

So far as the control of the disease in New England is concerned, a minimum expenditure at the present time has certain advantages. Apparently, the solution of the blister rust problem in New England is local control, and local control of the disease in commercial pine stands depends on whether the pines to be protected are worth

what it costs to destroy currants and gooseberries. If control work is carried forward this year the labor cost will be so high that it can scarcely be called "practical control" in any but very exceptional instances. For this reason it seems important to carry on the work in New England along purely experimental and educational lines until such time as sufficient labor can be obtained at reasonable wages.

Minimum cost of control depends especially upon

determining the most practical and effective methods of organization, and on ascertaining the exact facts relative to the distances at which pines become infected from currants, under varying conditions. This essential information should be supplied by continuing the present demonstration control experiments, and scientific investigations. With full knowledge of the facts at the termination of the war, work can be undertaken on a large scale and with assurance of financial profit.

DONATIONS TO THE LUMBER AND FOREST REGIMENTS RELIEF COMMITTEE

AMERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for the men of the forest regiments was to be started. Many substantial contributions were received from lumber companies and lumbermen following requests sent to them by the lumber organizations of which they are members and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments.

Contributions to January 5, 1918, are as follows:

Previously acknowledged	\$687.00	Kaighn, Robert, Philadelphia, Pennsylvania.....	\$10.00
Arkansas Land & Lumber Co., Malvern, Arkansas...	25.00	King Lumber & Mfg. Company, Nocatee, Florida.....	5.00
Badger Lumber Co., Kansas City, Missouri.....	10.00	Koehler, B. of the A. Koehler Co., Geneva, Nebr.	2.50
Bannister, F. J., Kansas City, Missouri.....	5.00	Krauss Bros. Lumber Co., New Orleans, La....	50.00
Batcheller, Robert, Washington, D. C.....	25.00	Krotter Company, F. C., Palisade, Nebraska....	2.50
Beebe, W. M., Kansas City, Missouri.....	5.00	Leidigh & Havens Lumber Co., Kansas City, Mo.	5.00
Bemis, H. C., Bradford, Pa.....	25.00	Lewis, M. H., New York City, New York.....	10.00
Bissell, John H., Detroit, Michigan.....	10.00	Lloyd Company, William M., Philadelphia, Pa..	25.00
Bodwell, Don R., Kansas City, Missouri.....	1.00	Lovejoy, P. S., Ann Arbor, Michigan.....	5.00
Bogert, Miss Anna, New York City, New York...	2.00	McCormick, Mrs. D. C., Pittsburgh, Pennsylvania	1.00
Boswell, T. S., Asheville, North Carolina.....	5.00	McCoy & Son, Inc., George A., Pleasant Lake,	
The Bright-Brooks Lumber Co., Savannah, Ga...	10.00	N. Y.	10.00
Brown & Company, George C., Memphis, Tenn...	50.00	Martin, Miss Annie D., Flat Rock, North Carolina	5.00
Brownell, R. G., Williamsport, Pennsylvania....	25.00	Menominee White Cedar Co., The, Marinette,	
Buschow Lumber Co., Kansas City, Missouri.....	10.00	Wis.	10.00
Butler, Miss Virginia, Stockbridge, Mass.....	9.00	Miscellaneous (A Friend).....	5.00
Caddo River Lumber Co., The, Kansas City, Mo.	10.00	Morgan Lumber & Cedar Co., Foster City, Mich.	25.00
Cale, D. H., Wichita, Kansas.....	5.00	Morgan, Mrs. J. P., New York City, New York...	100.00
Carter, E. T., New York City, New York.....	1.00	Morgan, J. P., New York City, New York.....	100.00
Case Fowler Lumber Company, Macon Georgia...	10.00	Oliver Lumber Company, Hastings, Nebraska...	5.00
Central Pennsylvania Lumber Company, Wil-		Parminster, L. R., Kansas City, Missouri.....	5.00
liamsport, Pennsylvania	250.00	The George S. Patterson Lumber Co., Savannah,	
Chaffee, R. R., Endeavor, Pennsylvania.....	5.00	Georgia	5.00
Chapman, H. H., Albuquerque, New Mexico....	1.00	Patterson, John L., Roanoke Rapids, N. C.....	10.00
Clark, Edgar J., Kansas City, Missouri.....	5.00	The Pine Plume Lumber Co., Savannah, Ga...	10.00
Colby, Forrest H., Augusta, Maine.....	2.00	Randolph, Mrs. L. E., Philadelphia, Pa.....	20.00
The P. N. Coleman Lumber Co., Savannah, Ga...	5.00	Richey, Mrs. Martha A., Portland, Oregon.....	10.00
Comfort Lumber Company, The George N.,		Riner Lumber Co., The, Kansas City, Mo.....	10.00
Cleveland, Ohio.....	10.00	Roth, Filibert, Ann Arbor, Michigan.....	25.00
Cooney, Eckstein & Co., Inc., Savannah, Ga....	5.00	Rothrock, Dr. J. T., West Chester, Pennsylvania.	5.00
Cornu, Theodore J., New York City, New York...	10.00	Sash & Door Manufacturers' of Philadelphia and	
Delph Lumber Company, Savannah, Georgia....	5.00	Vicinity, Philadelphia, Pennsylvania.....	25.00
Douglas Fir Exploitation & Export Co., San		Schofield-Lance Company, Reading, Pennsylvania	25.00
Francisco, California	50.00	Seawell Lumber Co., W. P., Kansas City, Mo..	2.50
Downman, Robert H., Washington, D. C.....	500.00	Smith, Carothers Lumber Co., Memphis, Tenn...	10.00
Duncan Shingle & Lumber Co., Kansas City, Mo.	10.00	Trask, Mrs. Jane, Utica, Montana.....	1.00
Dunham, Miss M. V., Chicago, Illinois.....	5.00	Tyler, W. D., Dante Russell Company, Virginia..	5.00
Elias Bro., Inc., G., Buffalo, New York.....	50.00	Utch, George W., Kansas City, Missouri.....	1.00
Finch, Prunyn & Company, Glen Falls, N. Y....	25.00	Waldeck, D. D., Kansas City, Missouri.....	2.50
Ferguson, J. A., State College, Pennsylvania...	2.50	Warden, G. H., Endeavor, Pennsylvania.....	1.00
Foster Lumber Company, Kansas City, Missouri.	10.00	Wells Lumber Co., J. J., Menominee, Mich.....	25.00
Fuellhart, W. O., Endeavor, Pennsylvania.....	10.00	Wharton, William P., Groton, Massachusetts...	100.00
Georgia Florida Yellow Pine Emergency Bureau,		Wheeler & Dusenbury, Endeavor, Pennsylvania..	250.00
Jacksonville, Florida.....	2500.00	Wheeler, N. P., Jr., Endeavor, Pennsylvania....	25.00
Griffiths & Company, Dallas, Texas.....	5.00	White, Capt. J. B., Kansas City, Missouri.....	100.00
Hatcher, John H., Kansas City, Missouri.....	2.50	Wholesale Sash & Door Association, Chicago, Ill.	250.00
Hatcher, J. S., Curtis, Nebraska.....	2.50	Wilde, Albert, Brooklyn, N. Y.....	2.00
Hatcher, W. A., Venango, Nebraska.....	5.00	Wittenmeyer Lumber Company, Harrisburg, Pa.	10.00
Hayes, Rutherford P., Asheville, North Carolina.	5.00	The G. M. Williams Lumber Co., Savannah, Ga...	5.00
Hiestand & Sons, B. F., Marietta, Pa.....	50.00	Wisconsin Land & Lumber Company, Hermans-	
Hirsch Lumber Company, Savannah, Georgia....	5.00	ville, Michigan	25.00
Hirst, Mary S. (Mrs. E. C.), Concord, N. H....	100.00	Wright Lumber Co., Burt J., Kansas City, Mo..	2.50
Holmes, J. S., Chapel Hill, North Carolina....	5.00	Wyatt, Mrs. W. S., Philadelphia, Pa.....	25.00
Hopson, Raymond E., Old Forge, N. Y.....	35.00		
		Total.....	\$5,964.00

WHEN YOU BUILD YOUR HOUSE

BY RAWSON WOODMAN HADDON

WHILE enterprising gentlemen with a mind for statistics occasionally figure out for us just how many years—hundred, thousand or million—it will be before our coal supply or our iron supply

gives out, it is a notable fact that these figures are seldom made to include lumber because there are always the possibilities of reproduction in forestry which cannot be applied to those other products.

"New York State alone has some 12,000,000 acres of land which are better adapted to growing timber than any other purpose, and of this area the State owns 1,800,000 acres constituting the Adirondack and Catskill Forest Reserves," says Prof. A. B. Recknagel, Forester of the Empire State Forest Products Association, in a statement just issued. The sentiment expressed in "Woodman, spare that tree," is not thoroughly sound, says Prof. Recknagel, who urges that the forests should be properly exploited under intelligent supervision in order that they may be made of the greatest use to the people of the State.

For the uses of domestic architecture the exploitation of the forest does not consist, simply, of chopping down trees and cutting them into so many clapboards and studs or beams.

In addition to all this it includes the transplantation of fully grown trees for the landscape architect's purposes, to regions where the natural growth is immature, as well as the growth and care of the smallest and most delicate shrubs for ornamental uses in carrying out the whole intent and purpose of the architect's design.

In the development of American architecture, that is, the true product—the really national architecture that embodies within itself all the best ideals of American home life—wood has always occupied a distinctly important position.

The earliest homes of colonial settlers—of which many are still in existence after generation upon generation of exposure and carelessness and neglect—were almost invariably built of wood.

In New York State alone there are more than 12,000,000 acres of land on which a new supply of timber can be grown.

The fact that so many of these buildings are still in existence speaks well for the durability of the material, while the fact that it was chosen by the great Colonial designers—the men who



THE WHITE PINE ENTRANCE DOOR
The sharpness of the mouldings could probably not have been obtained on any other wood.

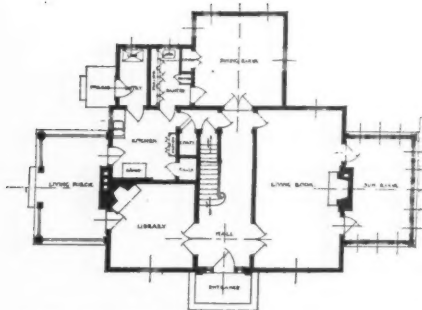


Hollingsworth & Bragdon, Architects.

RESIDENCE OF MR. WILLIAMSON T. CAROTHERS, NETHERWOOD, N. J.

built the glorious houses of Salem and Cambridge, for instance—and the fact that it is still chosen by architects of today out of the great mass of building materials that have been invented during the more recently passed years, speaks equally well for its plastic qualities in accommodating itself to the various conditions imposed by design, by structural necessities and the hundred and one other conditions that must be taken into consideration by the architect before the first steps of actual building are commenced.

During the course of these many years, it is natural that certain materials should have been found more satisfactory

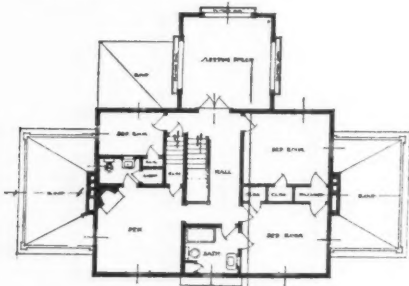


Hollingsworth & Bragdon, Architects.

First Floor Plan, The Carothers House,
Netherwood, N. J.

for certain uses than others, and the earlier architects and builders soon found it profitable—just as did the architect of the Carothers house illustrated here—to use cypress, for their shingle material. This refers, of course, to the Colonial builders in the New England States. At the present time, however, it is interesting to note that about 75 per cent of the wooden shingles used in the United States today are cedar.

The shingled walls and the roof of the Carothers house are covered with cypress shingles. The only other material used on the exterior is white pine, of which all the ornamental members such as the cornice, railings, the entrance porch, the side porches, etc., were built.



Hollingsworth & Bragdon, Architects.

Second Floor Plan, The Carothers House,
Netherwood, N. J.

In this connection it may be of interest to quote the following which is part of a letter from a well-known New York architect:

"You probably will be interested to know," he writes, "that the entire exterior of my own residence is constructed of clear, white pine, free from all knots and imperfections.

"The detail throughout was kept very delicate, and the sharpness of the mouldings could probably not have been obtained in any other wood. There was no delay in obtaining this material and the work has stood up so well that I am glad to give you this unsolicited recommendation."

For delicately carved members, as this letter suggests, white pine is generally the most satisfactory material. And the Carothers house may be pointed to as another example of the ability of white pine to "stand up" and hold its shape and resist wear and decay under exposure. Questions of material, however, should not be allowed to interfere with our appreciation of the good design of the house.

The location of the dining-room is both unusual and commendable. Its placement at the rear of the house gives it advantages in the number and arrangement of windows, and it offers the possibility of pleasant views over the lawns and gardens of its immediate and the adjoining land. Its relation to the kitchen, also, and the isolation of the latter from the remainder of the house, are points in its favor, and the possibility of direct service from the kitchen to the porch for outdoor dining is an advantage not to be overlooked.

The second floor bedrooms have many good features. Closet room is plentiful, and the relation between the rooms and the bath is, as a rule, direct. The sleeping porch is practically ideal, and for those who do not use it, cool draughts are assured by the fact that windows occur on two walls in each bedroom.

On the whole, the house is a most interesting one, both in its planning and in its exterior design and finish.

FORESTERS IN MILITARY SERVICE

(Concluded from Page 54.)

- Wentling, Floyd, 10th Engineers (Forest), state forest warden.
Westfeldt, W. O. (Yale For. School, '16).
White, Sylvester J., Co. B, Marine Barracks, Mare Island Vallejo, Calif. (Forest Ranger, U. S. F. S.).
White, Martin E., forest ranger, U. S. F. S.
White, William E., forest examiner, U. S. F. S.
Whitney, Raymond (Yale, '13), 20th Engineers.
Wieslander, A. E., 20th Engineers (Forest).
Wiggin, G. H. (Univ. of Minn., '13), 20th U. S. Eng., Washington, D. C.
Wilcox, J. M., Corp. Inf. (Univ. of Wash., '20).
Wilder, Raymond T., 20th Engineers (Forest), Mass. For. Dept.
Williams, Hubert C., 1st Lt. 10th Eng. (Forest), (Yale, '08).
Wilfond, J. E. (Penn. State Col., '14), 10th Engineers (Forest).
Wilson, F. G. (Mich. Ag. Col.).
Wilson, Robert (Univ. of Minn., '18), Capt. Co. F, 1st N. D., Charlotte, N. C.
Wilson, Stanley E. (Yale For. School, '14), forest ranger, U. S. F. S.
Wingett, Charles V., 10th Engineers (Forest), (Forest Ranger, U. S. F. S.).
Winn, Courtland S., Jr., 20th Engineers (Forest), Forest Ranger, U. S. F. S.
Wirt, William (Univ. of Wash., '18).
Wise, Lloyd (Ohio State, '17).
Wisner, —, Corp. 20th Eng. (Forest), (Syracuse, '17).
Withington, George T. (Biltmore), New England Saw Mill Units.
Wohlenburg, E. F., 2nd Lt., 10th Eng. (Forest), forest examiner, U. S. F. S., France.
Wold, Henry F. Ordnance School, Eugene, Oregon, U. S. F. S.
Wolf, A. L. (Mich. Ag. Col.).
Wolf, S. L. (Pa. State Col., '12), 1st Lt. 10th Eng. (Forest).
Wolfe, Kenneth, forest ranger, U. S. F. S.
Wolfe, Stanley L. (Penn. State, '12), 10th Eng. (Forest), U. S. F. S.
Woolsey, Theodore S., Jr. (Yale, '02), maj. 10th Eng. (Forest), Am. Exped. Forces, France.
Woodruff, James A., Lt. Col. 10th Eng. (Forest), France.
Woods, J. B., 1st Lt. 10th Eng. (Forest).
Work, Herman, 1st Lt. 10th Eng. (Forest), deputy forest supervisor, U. S. F. S.
Wulff, Johannes (Yale For. School, '17).
Wyman, Hiram (Univ. of Minn., '15), 10th U. S. Eng., A. E. F., France.
Wycoff, Garnett (Ohio State, '13), 10th Engineers.
- Y** EOMANS, E. J. (Yale For. School, '12), forest ranger, U. S. F. S.
Young, L. P., 2nd Lt. Inf. (Univ. of Wash., '17).
Young, Douglas E., private English army, killed in France April 10, 1917 (state forest warden, Maryland).
Young, Lt. Homer S., 16th U. S. Inf., care of Adjutant General, War Dept., Washington, D. C., U. S. F. S.

Z ELLER, R. A., forest assistant, U. S. F. S.
Ziegler, Robert H., forest ranger, U. S. F. S.
Ziegler, F. A., Capt. Coast Art. (Direc. Pa. State For. Acad.).

CANADIAN DEPARTMENT

BY ELLWOOD WILSON

SECRETARY, CANADIAN SOCIETY OF FOREST ENGINEERS

At a very successful meeting of the Commission of Conservation held in Ottawa, the outstanding feature, from a forestry standpoint, was the excellent paper read by Dr. C. D. Howe, of the University of Toronto, on the studies of cut-over pulpwood lands in the Province of Quebec, under the auspices of the Commission and in co-operation with the Provincial Forester, Mr. G. C. Piche, and the Laurentide Company. Dr. Howe's results show that in all probability it will be sixty years before another cut can be made and that at that time the probable crop will be about three cords to the acre. As the present ground rent is five

dollars per square mile per year and is likely to be increased in 1920 and at each succeeding ten year period, it seems hardly profitable to buy or hold such lands. It points to the necessity for a revision of cutting regulations and the commencement of a broad policy of reforestation. Dr. Howe points out how meagre our knowledge of reproduction and growth is in Canada and urges the establishment of sample plots for accurate studies in typical sections throughout the Dominion. The Council of National Research has already begun this work at the Military Reservation at Pettawawa in Ontario, through the Dominion Forestry Branch

and it is to be hoped that the Provincial Government will follow suit. Mr. E. J. Zavitz, Provincial Forester of Ontario, read a very interesting paper, illustrated by moving pictures, about the first year of his work in fire protection. The results are excellent and Ontario is to be highly congratulated on beginning such an important work. All good wishes for its future.

At a meeting, held on the same day, of the Canadian Society of Forest Engineers, the question of establishing a permanent Forestry Service in the Province of New Brunswick was brought up by Mr. Price, the Forester of that Province. This was thoroughly discussed and a draft of suggestions made for legislation to establish this. The most salient points were putting the work on a civil service basis,

including under the Forester all charge of Government scaling, fire protection and game protection. New Brunswick is to be congratulated on her progressive action and on joining the ranks of the army for proper protection and conservation of her forests.

An interesting and instructive meeting was held at Fredericton, N. B., when the field staff of the New Brunswick Government Forest Service was addressed by Prof. R. B. Miller, Dean of the School of Forestry, and G. C. Cunningham, in charge of the Dominion Government Plant Pathological laboratory, on the White Pine Blister Rust, and by J. H. Tothill, in charge of the Dominion Government Entomological laboratory on the Spruce Bud Moth. Among those present were Col. T. G. Loggie, Deputy Minister of Lands and Mines, A. T. Murchie, Superintendent of Scalars for New Brunswick, and W. E. McMullen, of the Crown Land Department. The opinion expressed by those present was that no White Pine Blister Rust has yet been discovered in New Brunswick. Arrangements were made whereby the Forest Service will do scouting this winter under the direction of Mr. Cunningham.

In regard to the Spruce Bud Moth, Mr. Tothill states, as a result of his studies of representative areas for the past five years in New Brunswick, that he is of the opinion that the present outbreak is now on the decline. The staff of the Forest Service will also collect data in this regard during the winter.

The following shows the present status of the forestry profession and educational institutions in Canada in regard to enlistments in the army. The showing is remarkable and it is doubtful if any other profession can equal this record:

	Foresters Enlisted	Foresters Canada	Students Enlisted
Dominion Forestry Branch	15	23	—
B. C. Forest Branch	15	10	—
Ontario Forest Service	1	2	—
Quebec Forest Service	—	33	—
New Brunswick Province	1	10	—
Laurentide Company	2	—	—
Riordan Company	—	—	—
Spanish River	—	1	—
Algoma Central Railway	—	1	—
C. P. R. Forestry	—	1	—
Conservation Commission	1	—	—
New Brunswick Ry. Co. (Included in New Brunswick.)	—	—	—
J. B. Snowball Company	—	—	—
Toronto University Students	11	—	40
U. N. B. Staff	—	1	—
New Brunswick University	—	—	33
Toronto University Staff	1	—	—
Laval Staff	—	—	—
Munitions Board	—	—	—
Clark & Lyford	—	—	—
Total	47	96	73
(17 killed—3 graduates and 14 students.)			

The first week in February will be of much interest to foresters in Canada. Meetings scheduled for it are: The Canadian Forestry Association; The Canadian Society of Forest Engineers; The Quebec Co-operative Fire Protective Associations; The Woodlands and Technical Sections of the Canadian Pulp and Paper Association and The Canadian

Lumbermen's Association. Matters of general interest will be discussed, slash disposal, right-of-way clearing, fire protection, hardwood utilization and reforestation. All American foresters are cordially invited to be present at these meetings, which will all be held in Montreal.

Mr. Volkmar, the Forester for the Riordan Paper Company and the Ticonderoga Paper Company, is arranging to plant Carolina poplar in the neighborhood of Ticonderoga to supply the mill with raw material for use with the soda process. This company planted 200,000 spruce last year and expects to plant even more largely this coming spring.

Several American firms who own lands in Quebec have refused to join the co-operative fire protective associations. This makes the cost of patrol higher for the members and exposes them to danger from these unprotected lands. The Quebec Government does not look with favor on such a policy and such firms might be warned to be more public spirited and less selfish for their own good.

CURRENT LITERATURE

MONTHLY LIST FOR DECEMBER, 1917

(Books and periodicals indexed in the library of the United States Forest Service.)

FORESTRY AS A WHOLE.

Proceedings and reports of associations, forest officers, etc.

India—Bengal—Forest dept. Annual progress report on forest administration for the year 1915-16. 54 p. Calcutta, 1916

Kentucky—State board of forestry. Third biennial report of the state forester of Kentucky, 1916-17. 39 p. pl. Frankfort, 1917.

United States—Dept. of agriculture—Forest service. Report of the forester, 1916-17. 36 p. Wash., D. C., 1917.

FOREST AESTHETICS.

Dallas, Tex.—Forestry dept. The ordering and planting of shade trees. 4 p. Dallas, 1917. (Bulletin No. 1.)

Sargent, Charles Sprague. The trees at Mount Vernon. 16 p. pl. Cambridge, Mass., 1917.

FOREST EDUCATION.

Montana, University of—School of forestry. Ninth annual short course for forest rangers, Jan. 2 to March 23, 1918. 6 p. il. Missoula, Mont., 1917.

FOREST DESCRIPTION.

Chevalier, Jean Baptiste Auguste. La forêt et les bois du Gabon. 468 p. il., pl. Paris, 1916. (Les végétaux utiles de l'Afrique tropicale française, fasc. 9.)

Oregon—State board of forestry. Oregon forest facts; brief review of Oregon's timber resources and what the state and private activity in forest protection has accomplished. 8 p. Salem, Oreg., 1917.

Laurent, Louis. Une promenade dans la région forestière des Cvennes. 8 p. Marseille, 1910.

FOREST BOTANY.

Rock, Joseph F. The ohia lehua trees of Hawaii. 76 p. il. Honolulu, 1917. (Hawaii—Board of agriculture and forestry—Division of forestry. Botanical bulletin No. 4.)

FOREST PROTECTION.

Insects

Matheson, Robert. The poplar and willow borer. 29 p. il., pl. Ithaca, N. Y., 1917. (Cornell university—Agricultural experiment station. Bulletin 388.)

Wade, Otis. The sycamore lace-bug, *Corythucha ciliata*. 16 p. il. Stillwater, Okla., 1917. (Oklahoma—Agricultural experiment station. Bulletin No. 116.)

FOREST MANAGEMENT.

Maryland—State board of forestry. Plan of co-operation between woodland owners and the state forester. 2 p. Baltimore, Md., 1917. (Forestry leaflet No. 18.)

FOREST ECONOMICS.

Forest policy

Black, Robson. The case for New Brunswick's forests. 9 p. pl. Ottawa, Canadian forestry association, 1917.

Recknagel, A. B. Make state forests productive. 8 p. il. n. p., 1917.

FOREST UTILIZATION.

Lumber industry

Kerr, Robert Y. Retail lumber sheds and sales equipment. 164 p. il. Chicago, American lumberman, 1917.

Wood-using industries

Clark, Frederick C. American and foreign paper trade periodicals; a list of American subscribers maintaining permanent files. 16 p. N. Y., 1917.

Rabild, Helmer and Parks, K. E. Home-made silos. 55 p. il. Wash., D. C., 1917. (U. S.—Dept. of Agriculture. Farmers' bulletin 855.)

Smith, Franklin H. and Helphenstein, R. K., Jr. Pulpwood consumption and wood pulp production, 1916. 30 p. diags., tables. Wash., D. C., Darby printing co., 1917.

WOOD TECHNOLOGY.

Snow, Charles Henry. Wood and other organic structural materials. 478 p. il., pl. N. Y., McGraw-Hill book co., inc., 1917.

WOOD PRESERVATION.

Tiemann, Harry Donald. The kiln drying of lumber; a practical and theoretical treatise. 316 p. il., pl., diagr. Phila. & London, J. B. Lippincott Co., 1917.

AUXILIARY SUBJECTS.

Science in general

Fleming, A. P. M. Industrial research in the United States of America. 60 p. pl. London, 1917. (Great Britain—Dept. of scientific and industrial research. Science and industry, paper No. 1.)

Society for American fellowships in French universities. Science and learning in France, with a survey of opportunities for American students in French universities; an appreciation by American scholars. 454 p. pl. Chicago, Ill., 1917.

Grazing

Jardine, James T. & Hurtt, L. C. Increased cattle production on southwestern ranges. 32 p. pl., maps. Wash.,

Are you on the Mailing List for Catalog of



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D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 588.)

Aviation

Fales, Elisha Noel. Learning to fly in the U. S. army; a manual of aviation practice. 180 p. il. N. Y., McGraw-Hill book co., 1917.

Riach, M. A. S. Air-screws; an introduction to the aerofoil theory of screw propulsion. 128 p. il. London, Crosby Lockwood and son, 1916.

PERIODICAL ARTICLES.

Miscellaneous periodicals

Agricultural gazette of Canada, Sept. 1917—Shade tree and forest insects in Manitoba, p. 755-62.

Alaska, Oct. 1917.—Alaska timber may end the war, by Lynn T. Worden, p. 14.

Aviation, Nov. 15, 1917.—Balsa wood, p. 531.

Country life, Sept. 15, 1917.—Cupressus lawsoniana as a hedge plant, by H. C., p. 261.

Country life, Oct. 6, 1917.—Revival of wooden shipbuilding, by Harold J. Shephstone, p. 321-3.

Forum, Sept. 1917.—Lumber for a thousand ships, by Charles J. Storey, p. 363-6.

Garden magazine, Nov. 1917.—Arnold arboretum; what it is and does, by C. S. Sargent, p. 122-5.

Gardeners' chronicle, Oct. 27, 1917.—Ginkgo biloba, by H. J. Elwes, p. 166-7.

Gardeners' chronicle of America, Sept.-Oct. 1917.—Forestry upon a private estate, and its landscape possibilities, by A. Smith, p. 329-30, 375-6.

House and garden, Sept. 1917.—The best baker's dozen of evergreen trees, by Grace Tabor, p. 27-8, 72, 74, 76.

International review of agricultural economics, Aug. 1917.—Prevention of forest fires, p. 26-8.

Journal of heredity, Dec. 1917.—American sycamores are possibly hybrids, by Augustine Henry, p. 553.

Journal of American leather chemists' association, Nov. 1917.—The examination of logwood, p. 586-98.

Journal of the New York botanical garden, Aug. 1917.—The Jamaica walnut, by John K. Small, p. 180-6.

Phytopathology, Oct. 1917.—Two new forest tree rusts from the northwest, by H. S. Jackson, p. 352-5; Notes on wood-destroying fungi which grow on both coniferous and deciduous trees, by J. R. Weir, p. 379-80.

Plant world, Oct. 1917.—The interpretation and application of certain terms and concepts in the ecological classification of plant communities, by George E. Nichols, p. 305-19.

Plant world, Nov. 1917.—Comparative length of growing season of ring-porous and diffuse-porous woods, by Ferdinand W. Haasis, p. 354-6.

Rhodora, Nov. 1917.—Note on fruit of mountain magnolia, by N. M. Grier, p. 256.

St. Nicholas, Nov. 1917.—Sea-going lumber rafts, by Day Allen Willey, p. 77-8.

Scientific American, Oct. 20, 1917.—Protecting wood from decay and fire, by C. H. Teesdale, p. 290.

Scientific American supplement, Sept. 29.



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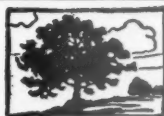
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1917.—Fighting forest fires, by A. L. Dahl, p. 193, 200-1.

Scientific American supplement, Oct. 6, 1917.—Blister rust of the white pines, by S. J. Record, p. 216-18.

Scientific American supplement, Nov. 17, 1917.—Annatto of commerce, by C. D. Mell, p. 309.

Special libraries, Dec., 1917.—Russian scientific literature, by Raphael Zon, p. 157-9.

United States—Dept. of agriculture. Monthly weather review, July, 1917.—Some field experiments on evaporation from snow surfaces, by F. S. Baker, p. 363-6.

United States—Dept. of agriculture. Weekly news letter. Nov. 28, 1917.—Urged to burn wood; larger use of firewood in northern and eastern states recommended to supplement coal supply, p. 7.

United States—Dept. of agriculture. Weekly news letter, Dec. 5, 1917.—Black locust; considerable demand for this wood by wooden ship industry; how to distinguish from honey locust, p. 8.

World's work, Dec. 1917.—Can we build those ships in time? by Burton J. Hendrick, p. 172-86.

Trade journals and consular reports

American lumberman, Nov. 17, 1917.—Lumbermen's regiment soon to go overseas, p. 55.

American lumberman, No. 24, 1917.—Water power to conserve coal, by Gifford Pinchot, p. 29.

American lumberman, Dec. 1, 1917.—Protecting the bottoms of wooden ships, by A. K. Armstrong, p. 52-3.

American lumberman, Dec. 8, 1917.—Ten thousand soldiers to work in woods, p. 42-3; British timber trade fights government control, by W. J. Drewry, p. 55.

Canada lumberman, Nov. 15, 1917.—The wooden shipbuilding industry, p. 47; Early days of Canadian shipbuilding, p. 48-9; Imperial munition board standard ships, p. 50-2; Wooden shipbuilding in British Columbia, by A. F. Menzies, p. 53-7; Shipbuilding in the Maritime provinces, by Elihu Woodworth, p. 58-60; Quebec shipbuilding, past and present, by George Gale, p. 61-3; Future of shipbuilding in B. C., by John Eadie, p. 63-4; The importance of Canadian shipbuilding, by Edward Harper Wade, p. 64-5; Wooden shipbuilding in New Brunswick, by R. E. Armstrong, p. 66-7; Ship keels and other special timbers, by Elihu Woodworth, p. 68-9; Timber requirements of naval service, by J. A. Wilson, p. 70; Newfoundland shipyards busy, by J. W. McGrath, p. 70-1; How modern wooden ships are constructed, by H. Cole, p. 72-77.

Engineering and contracting, Nov. 28, 1917. Density factor safe guide to strength of structural timbers, by Sanford M. Zeller, p. 437-8.

Engineering and mining journal, Dec. 8, 1917.—Economic importance of wood



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preservation, by Kurt C. Barth, p. 985-8.

Engineering news-record, Nov. 29, 1917.—Simple rule for strength of wooden beams, by W. J. Howard, p. 1015.

Hardwood record, Dec. 10, 1917.—Dry kilns for government service, by T. D. Perry, p. 19-20.

Journal of industrial and engineering chemistry, Dec. 1917.—Tannin content of Pacific Coast trees, by H. K. Benson, and Frank M. Jones, p. 1096-8.

Lumber trade journal, Nov. 15, 1917.—Edible fruits of forest trees are taken cognizance of by U. S. Forest service, p. 23.

Lumber world review, Nov. 10, 1917.—Seeing forestry work in the Adirondacks, by Samuel N. Spring, p. 47-8; The new challenge to the lumber industry, by Wilson Compton, p. 48-9; Cornell university forest school in summer, by Bolling Arthur Johnson, p. 50-2; History of the ten saw mill units from New England that are cutting timber in Scotland, by Paul D. Kneeland and others, p. 53-8.

Lumber world review, Nov. 25, 1917.—The white pine blister rust, and a moral, by Russell T. Edwards, p. 23-5.

Lumber world review, Dec. 10, 1917.—Tests of roofing materials to determine their comparative fire resistance, by Bror L. Grondal, p. 25-33; New process of vulcanizing lumber, p. 36-9.

Paper, Nov. 14, 1917.—Canadian government paper laboratories, p. 14-15.

Paper mill, Nov. 3, 1917.—Dyes from pulp waste, by J. Robinson Silver, Jr., p. 40.

Pioneer western lumberman, Nov. 15, 1917.—Forest service builds trail, p. 20; Pinnacles form a picturesque California wonder region, by R. F. Wilson, p. 21; Sugar pine, p. 22-3; More than a million head of stock grazed on national forests of Oregon and Washington, p. 24.

Power, Nov. 20, 1917.—The possibilities of peat as fuel, by John Olsen, p. 696-700.

Pulp and paper magazine, Nov. 15, 1917.—Weights of timber, p. 1072.

Railway age gazette, Nov. 2, 1917.—A study of wood preservatives and marine borers, by C. H. Teesdale and L. F. Shackell, p. 801-4.

Railway review, Nov. 17, 1917.—The autobiography of a tree, by Edward Labouchere, p. 605-7.

Railway review, Dec. 1, 1917.—Wood and steel car construction, by H. S. Sackett, p. 658-62.

St. Louis lumberman, Nov. 15, 1917.—Logging with caterpillar, by J. W. Hill, p. 12-13; Lessons to be learned about logging, by R. D. Forbes, p. 49.

St. Louis lumberman, Dec. 1, 1917.—The twentieth engineers, p. 44; A new dry kiln attachment, by John E. Williams, p. 47.

Southern industrial and lumber review, Nov. 30, 1917.—About forest conserva-

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tion, by R. D. Forbes, p. 13; Storax from gum trees, p. 57.

Southern lumberman, Nov. 17, 1917.—Revised timber schedule for standard wood steamship, Gulf and Atlantic Coast, p. 24; Forestry battalions reviewed by officials, p. 26.

Southern lumberman, Dec. 1, 1917.—First two battalions of forestry regiment have gone to France, p. 27.

Timber trade journal, Nov. 17, 1917.—Ash and airplane construction, p. 701.

Timberman, Nov. 1917.—The season of 1917, by E. T. Allen, p. 35-6; Gasoline locomotives for logging service, by J. E. Buckingham, p. 42-4; Gasoline locomotives in logging operations, by Henry H. Logan, p. 44-6; Gasoline donkey engine, by Fred Leckenby, p. 46; The location of logging railroads, by W. H. Dunn, p. 50-2; Bridge construction, by A. R. Baker, p. 52; Railroad bridges, by S. A. Stamm, p. 52-3; Forest schools and the lumber industry, by Hugo Winkenwerder, p. 53-5; University co-operation in night schools, by C. H. Shattuck, p. 55-7; Practical application of theoretical training, by C. R. Rope, p. 58; Logging engineering and university training, by A. H. Powers, p. 58-9; The value of logged-off timber lands, by C. L. Wheeler, p. 64 I-J.

United States daily consular report, Nov. 20, 1917.—Venezuelan production of balata, by Homer Brett, p. 698-9.

United States daily consular report, Nov. 30, 1917.—Market for Kongo gum copal desired, p. 818-19.

West Coast lumberman, Dec. 1, 1917.—United States Food administration suggests menus for logging camps, p. 22-3; Ship timbers must be properly treated to obtain maximum results, by Bror. L. Grondal, p. 24-5, 29.

Wood-worker, Nov. 1917.—The manufacture of wooden silos, by G. W. Davis, p. 30-1; Theory vs. practice in ventilating dry kilns, by A. E. Krick, p. 38-9.

Forest Journals

American Forestry, Dec. 1917.—Ye hollyhede, by Donald A. Fraser, p. 709; A forester at the fighting front, by P. L. Buttrick, p. 710-716; How warfare taxes the forests, p. 716-717; Foresters and woodsmen in war work, p. 718-723; Only a volunteer, by a private in the 20th Engineers (Forest), p. 718; A problem of erosion, by R. S. Maddox, p. 724-726; Free trees for Pennsylvania, p. 726; Forestry prize award at Cornell, p. 726; A ballad of the timber cruiser, by Lew R. Sarrett, p. 726; Landscape and forestry, by Smith Riley, p. 727-731; A wonderful walnut tree, by V. W. Killick, p. 731; Dead leaves valuable, p. 731; Climatic records in the trunks of trees, by A. E. Douglass, p. 732-735; White pine blister disease, p. 735; Donations to the lumber and forest regiments relief committee, p. 735; The forest fire season, p. 735; The woodpeckers, by A.

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Biltmorean, Sept. 1917.—Problems in timber estimating, by Howard R. Krinbill, p. 26-7.

Canadian forestry journal, Nov. 1917.—Will Russia's forests pay her war debts, by A. J. Sack, p. 1380-81; An Adirondack forest experiment, by R. H. Campbell, p. 1384-8; Nova Scotia's forest position, by F. C. Whitman, p. 1389-92; Over 7,000,000 trees planted on prairies, p. 1392-3; The story of Canada's forests, by James Lawler, p. 1395-9; Making rugs from paper fibre, by Sydney A. Bonaffon, p. 1400-4; Recollections of Canada's greatest forest fire, p. 1409-10.

Conservation, Dec. 1917.—Fight is on to save our valuable pine, by Clyde Leavitt, p. 46.

Indian forest records, 1917.—A note on thitsi, Melanorrhoea usitata, Wall., with special reference to the oleoresin obtained from it, by E. Ben-skin and A. Rodger, p. 97-127.

Journal of forestry, Nov. 1917.—Some factors influencing the reproduction of red spruce, balsam fir, and white pine, by Barrington Moore, p. 827-53; Utilization and reforestation of chestnut blighted lands, by Leonard C. Barnes, p. 854-8; A practical xylometer, by J. S. Illick, p. 859-63; A simplified method of stem analysis, by T. W. Dwight, p. 864-70; Developments in the marking of western white pine (Pinus monticola) in northern Idaho, by C. K. McHarg and others, p. 871-85; What is a basis for yield tax, by Filberth Roth, p. 886-90; Silviculture at Axton and in the Adirondacks generally, by Ralph C. Bryant, p. 891-5; Accelerated growth of spruce after cutting in the Adirondacks, by John Bentley, Jr., and A. B. Recknagel, p. 896-8; Proceedings of the 11th annual convention, Dec. 19, 1916; Review, by B. E. Fernow, p. 899-902.

Ohio forester, Oct. 1917.—Some Ohio weed trees, by W. J. Green, p. 39-41; Summer recreation grounds, by J. J. Crumley, p. 42-4; The scarlet oak, Quercus coccinea, by J. J. Crumley, p. 45-7.

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Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1918 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management respectively; adequate appropriations for their care and management; Federal co-operation with the States, especially in forest fire protection.

State Activity by acquisition of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by co-operation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquisition of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid the lumberman in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

KEEP THE HUT FIRES BURNING!



GENERAL PERSHING SAYS THAT THE Y. M. C. A. IS "VITAL FOR THE MAINTENANCE OF THE MORALE OF OUR ARMIES"—A BROAD STATEMENT AND A SPLENDID TRIBUTE TO AN ORGANIZATION WHICH HAS WORKED WITH HIGH PURPOSE AND UNREMITTING ENTHUSIASM SINCE THE INCEPTION OF THE WAR.

TO THE AMERICAN SOLDIER AND SAILOR, BOTH IN THIS COUNTRY AND OVERSEAS, THE Y. M. C. A. REPRESENTS THE AMERICAN HOME, THE CHURCH, THE SCHOOL AND COLLEGE, THE BEST OF CLUB LIFE AND THE STAGE. THE RED TRIANGLE MAN THE WORLD OVER IS THE SOLDIER'S PAL. WHAT THE AMERICAN Y. M. C. A. IS DOING FOR OUR BOYS IN FRANCE IS A WELL KNOWN STORY.

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TO CARRY on this work a great fund is necessary. The Y. M. C. A. has pooled and mobilized its resources to help win the war for the United States and her Allies, but there is a limit to those resources. The drive for funds cannot—must not—fall short of what is needed. It is for "our boys." Back up the "Y" by sending your bit to

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